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Decorative Art at Burlington House.

THE contents of the "Water-colour Room" at the BurlingtonHouse Loan Exhibition are described in the catalogue as "a collection illustrating the Sculptor-Goldsmiths' Art"; a rather awkward phraseology, which is, however, perhaps the best definition of a class of artistic work rather difficult to define. It includes, one may say, that kind of work in gold or silver, with or without the embellishment of coloured enamel or precious stones, in which articles of use or of personal adornment are made the vehicle of original artistic thought and fancy. The collection is crowded into a small space, some drawings round half the wall, and a few cases; but the amount of interesting and beautiful work to be found there is much more extensive and various than would be supposed at a first glance.

The great majority of the collection is lent by a single owner—Sir J. C. Robinson, to whom the public are much indebted for his liberal contributions to the show. The set of drawings hung on the walls are entirely from his collection, and represent original designs for work chiefly of the fifteenth, sixteenth, and seventeenth centuries. Nearly all are of interest in themselves, and the majority are the work of artists of name and fame.

Into designs of this class there comes a great deal of architectural or semi-architectural detail. The translation of architectural detail into forms suitable for silversmiths' work is a problem not very often successfully solved. In the work of the present day it generally means little better than mere imitation of architectural features in miniature; a key with a Corinthian column and capital for the shank, for instance, used in a position and a manner for which the form selected is quite unsuited. We want in such a case, if architectural detail is used at all, a modification of the architectural form into something which recalls the original, but in a form suitable to the character and capabilities of metal-work. Generally speaking, architectural detail has to be attenuated in character in the process of translation into metal-work. This is often exceedingly well done in Mediæval monstrances and other such articles, where we see the general form of the Gothic buttress, for instance, changed into a thin-lined and elegant fringe to the body of the article, in a manner recalling its origin and suggesting architectural associations, but deprived of architectural constructive character. This is not badly done in the first drawing exhibited, "Design for a Monstrance, Flemish Gothic *c.* 1490"; not a good drawing (many of the drawings here are very faulty in mere draughtsmanship), and not representing a good form of detail; but the detail is properly treated for silver work—thinned out into slender proportions. In the "Italian Design for a Bronze or Silver Vase" (2) we have parted company with architecture again, except so far as the mere division of the design by mouldings is concerned; this is the simple vase form; a good design, shown in exceedingly bad drawing, with all the curves out of perspective; the man who did this was not a master in drawing, at all events; it served as a diagram for the silversmith to work from; but it is rather odd that a drawing should be exhibited for our admiration, as a bit of old work, which would infallibly put the lowest grade South Kensington student out of court. No. 3, "Design for a Saliera" (salt-cellar), by Pierino del Vaga, brings us round into the right path again, and is well worth study. This is one of semi-architectural designs; an octagon on plan with concave sides; on the upper portion are terminal figures with their backs to the centre-piece; but the terminals, instead of being solidly modelled, fly out from the background in curves of thin metal standing free, exactly in a manner which would be totally out of place in an architectural terminal, but which is the very treatment for metal. If this design were re-drawn by a modern artist in the modern manner, it would unquestionably be attributed to Mr. Gilbert, who more than any one else has assimilated the Italian Renaissance spirit in the treatment of metal.

With drawings No. 5 and 7 we come across the weaknesses of Renaissance design; the employment of the goat's head and neck as the mouth of the vase in one—though this is a fancy that may pass; the griffin's head and neck springing out of a human mask on the front of the vase in No. 7—a fancy that may not pass, but which, like Artemus Ward's Red Indian, "is poison wherever met with," even in Italian Renaissance design, where there is far too much of it. Bad taste is bad taste, in whatever period of art it is found.

Stothard's designs mean to be the right sort of thing, without always quite succeeding. His "Design for a Panel for Wall-painting or Painted Glass" (10), with cupids seated in the bells of conventional flowers, is pretty and truly decorative in some parts, but spoiled by the rather clumsy figure of the dancing woman in the upper portion, and still more by the clashing of natural with conventional foliage forms in the grape and vine leaf ornament round the top. His two designs for silversmiths' work (11 and 12), for alto-relief groups round the outer edge of a bowl or salver, are very good work of their kind, but they seem somehow to have "Rundell & Bridge" stamped on them, and the relief is too high for the decoration of objects of use; there is too much the look of incrustation about it. There is the mark of "Rundell & Bridge" too about Flaxman's in many respects fine design for a silver candelabrum (13); a design triangular on plan, with three nondescript animals (bears?) backed against the base of the pedestal, and three draped female figures above who hold up an infant to a fourth figure that stoops head downwards to take it; these groups forming the stem of the candelabrum. This is an admirable drawing; but one does not like the use of the figure, or of a group of figures, in so important a "piece," merely as a stem to be clutched by the hand whenever the thing is moved. In other respects it would be a fine "centre-piece" for a table, no doubt. The design for a monument in St. Paul's by Grinling Gibbons (14) is amusing; the original contract is given, wherein it is described as "a handsome marble monument enriched by festoons, and mantling elevated by two Cupids": need we go further? Nor is Benvenuto Cellini's mace (15) worth very much; but Michelangelo's "Saliera" (17) for the Duke of Urbino is a thing of fine and sculpturesque design, especially in the curious and original treatment of the birds' necks which seem flattened on the top of the lid and peer over the edge. The feet are rather too furniture-looking in design, for silver. A note in the catalogue mentions that this is the first drawing which has come to light for a piece of work which has probably perished, and which is otherwise known of only through the letters which passed between the great artist and the duke's agent. Some of the questionable taste of

the time is in it, in the grotesque masks which are thrust into the design, but there is a kind of impress of Michelangelo's hand about it. Next to this hangs his finished drawing for the "Fall of Phaëton," a design well known by engravings.

A pen drawing (19) of Dürer's well-known design of "The Coat of Arms with the Skull," whether by the master himself or not (on which the catalogue speaks doubtfully) is a beautiful piece of pen drawing, possibly rather too neat and finished to represent the large and strong hand of Dürer. A design by Dürer for execution in relief in silver (20) is a charming bit of work. It is drawn in light medium on a dark ground (giving somewhat the effect of silver), and represents the Virgin enthroned, the arm or standard of the throne being formed by a child-angel with a harp standing on a vase; the *encadrement* of the figure is only finished on one side. There is a great charm about this little design, which stands quite alone and resembles nothing else in the room.

Among the remaining drawings are two or three other German designs assigned doubtfully to Albert Dürer, and which in point of taste present some of the worst qualities of German Renaissance work; designs for two bronze door-knockers (26) "by a Venetian artist, *c.* 1600," and which illustrate the mistake of over-elaboration and too lavish throwing-away of figure-design — the knockers showing small nude figures sprawling all about them in a manner quite inconsistent with their proper mechanical expression as knockers; and eleven original designs by Giulio Romano, or working drawings from his designs by his scholars or by goldsmiths working under his orders for the Gonzaga family. The style of these, though they are not, perhaps, what would be called remarkable works, is for the most part very pure and good; the design for an incense-vessel (27), with its rather flat shape (somewhat like that of a Greek cylix) and its eagle-head handles, is exceedingly good; the two designs for silver ewers, 29 and 30, are also worth special attention; and the design for a salt-cellar (37), though simple enough, has the merit of consistency and of good lines. There are fewer faults in these designs by Romano and his pupils than in some of the earlier-mentioned drawings; yet one cannot help admitting that some of those which have the most glaring faults are also the most striking and original, and that genius without good taste is sometimes better than good taste without genius.

The contents of the cases of objects in the room we can only describe generally, drawing attention here and there to some which are of exceptional artistic value or which illustrate some point in regard to design. Case A contains mainly articles of personal adornment, jewelled pendants and crosses, &c. The group numbered 7 contains some Spanish pectoral crosses which are worth attention, especially one ornamented with a delicately-executed geometrical diaper in relief in gold. A reliquary, a Spanish cylindrical crystal gold-mounted (10 H), is a beautiful little object; the knife and fork with ivory handles carved into figures (28), and believed to be by Faidherbe of Brussels (*c.* 1630), represent work of more than usual vigour and character; a scent-case, silver inlaid with niello work (29), "probably Florentine," is an excellent example of this form of inlay ornament. One of the most original things in Case A is the casket of old Chinese porcelain (48) mounted on ormolu; this is called "French work probably eighteenth century," which we presume refers to the mounting, but the point in the design is the treatment of the porcelain cover, with a deeply-incised conventional foliage design sunk from the flat surface, a beautiful and most effective bit of work, combining richness of effect with severity of line.

All the objects referred to are the loan of Sir J. C. Robinson unless where otherwise mentioned. Case B, a very miscellaneous collection, contains some of the most remarkable things in the exhibition. Prominent among these is the small gilt bronze lectern (49) of Spanish work of about 1520, and believed to be by the goldsmith Becerril of Cuenca; it formerly belonged to one of the private chapels in the Cathedral of Valencia. This is a rich and delicate work, very Spanish in general effect, though the design of the scroll-work in relief in front is on Italian models; the book-rest is curiously formed of an open railing of semi-architectural design, each rail consisting of a square baluster-like shaft in dark bronze, capped by a gilt female terminal figure. The Italian casket (52), silver "parcel-gilt" (as South Kensington delights to call it), is a useful lesson to the effect that mere richness of treatment and material availeth not to produce art, where fancy and power of design are absent. This is a large casket with a barrel-roof lid, divided up mechanically into stiles and panels, as it were, with ornament at the intersections of the panels; it must have cost a good deal to produce it, and it is worth little when done. Compare it with the Indo-Portuguese Goa casket on the other side of the case (53), carved ivory with lock and hinges in gold, and the distinction between art and mere industry is emphasised. The Indian gold-enamelled box in the form of a shell (72) is an object of marked character. But nothing in this case is better, from an artistic point of view, than the Elizabethan silver-gilt cup and cover (89) at one end of the case, a work in perfect taste, showing pure and harmonious form and proportion, relieved with ornament which is sufficient to give it richness of surface-effect without in any way interfering with the lines of the design. Artists in such work should study this example, and learn its lesson.

In the centre of Case C is a fine and curious piece of work (98) of very unusual appearance. This is an appliqué relief, repoussé work in gold on a ground of blacked glass. It appears to represent the dead Christ, and the Virgin standing mourning over Him; her figure, with very finely designed drapery, standing out in gold against the black semi-transparent background. It is by the Venetian goldsmith, Cesare di Treviso, and was made for Philip II. of Spain. Among the finest objects in the same case is the Venetian cassolette or perfume-burner (108) in gilt metal, with pierced panels, and designed with a cornice and a dome-shaped top, also pierced in arabesque patterns. It has that semi-Oriental feeling which (naturally) often permeates Venetian decorative work. An Indian box enamelled in silver (133) is another of the artistic gems of this case; among its curiosities are a box (138) carved out of a shell, with a design showing a column and two figures, and a long-stemmed pipe in ivory, Venetian work (143), carved all along the length of the stem with foliage and little nude figures; a beautiful bit of work, though not suitable to its position, for the stem could hardly be comfortable to hold, and (as in the case of the Venetian knockers before-mentioned) the figure as an ornament seems to be misapplied here. The stem is made in three pieces fitting into each other.

Case F contains mostly larger objects than the rest; large ewers, salvers, and cups, among which again instructive contrasts may be noted, and lessons learned both as to what to imitate and what to avoid. The great burly German cup (3) lent by Lord Battersea, all over lumps and knobs, is an example on the latter side; and Lord Rothschild's German cup (9), "silver-gilt, richly ornamented and enamelled," and no doubt a very costly piece of work, may be compared with its pendant in the shape of the Spanish Gothic cup (13) lent by the same owner, a cup with a flat-shaped bowl with a spirally-scallopped cover. The latter is very simple work compared with No. 9, but how far superior in balance and proportion of outline and in all the qualities which go to give artistic value to such an object. The Germans were the chief sinners in regard to over-elaboration of this kind, but Lady Wallace's cup (7), Italian late sixteenth-century work, shows that the Italians were not always immaculate in this respect. This is a most costly-looking work, and probably costly enough in reality, but it looks too much as if that costliness had been the main object; it is encrusted with jewels to an extent which out-does its own object, destroys repose of design, and interferes with the appreciation of form. A small cup, silver parcel-gilt (12), lent by Mr. Durlacher, is an object worth study, and so is the salt-cellar (11), lent by Lord Rothschild, "silver-gilt, probably Spanish," a piece of work on very architectural lines, with six terminal caryatides surrounding it, standing out free from the body of the box, on projecting moulded pedestals which in their turn are carried on small figures of lions which form the feet. These are out of scale, of course, with the caryatides, which is a defect; but in general this is a good example of the translation of architectural design into silversmiths' work.

Case G contains mostly small objects, lent by different owners; pendants, brooches, &c., and there is a great deal that is beautiful and interesting among its contents. Two or three Russian crosses, &c., have a character of their own, and one bit of Russian work, a hexagonal pendant in silver (3), with a head of Christ in gold under a crystal, is of exceptional picturesqueness of design and effect. A gold enamelled Spanish cross (16) is peculiar and very pretty in its effect from the use entirely of white enamel. Among other objects of special interest in this case are the small miniature-frame (45) of gold pierced, and with foliated repoussé ornament, lent by Mr. Salting; and the Dutch silver book-clasp (46) lent by Mr. Spread. But the gems of this case are the Greek ear-rings and necklace (35, 36,) lent by Mr. Heseltine. The necklace, gold with onyx beads, and the clasp formed by two bulls' heads, is a remarkably fine specimen of a style of necklace design of which there are a good many examples in ancient Greek work; but the ear-rings are exceptional. They are little nude winged figures, the pair slightly varied in attitude, the wings large and widely spread, in the most delicate thin gold, stretching upwards above the figures. These are the most beautiful things in the whole collection; they are the pure poetry of goldsmiths' work, and the few goldsmiths among us who attempt anything artistic should not fail to look at them. How much the English know about the achievements of the ancient Greek goldsmith we had an intimation while looking at these, in the remark of a bystander to her companion—"Only think of the Greeks being able to do that!" It seems the goldroom of the British Museum is still a *terra incognita* to the average Londoner, who ought otherwise to be aware that ancient Greek gold-work holds the supreme place, for beauty of design and delicacy of execution, above all other productions of the kind. The devotion of a room at the Burlington House loan exhibitions to work of this kind may do something to wake up the public taste and knowledge on such subjects, and it is to be hoped the experiment will be repeated. There must be plenty of material in England to fill a room with ancient decorative art at the winter exhibitions; and perhaps in time the Royal Academy may come to see that it is advisable to stimulate the modern production of artistic gold and silver work in their more fashionable summer exhibitions, where it is at present so entirely neglected.

WINDOW, ST. GILES' CATHEDRAL, EDINBURGH.—A large five-light memorial window has just been placed in St. Giles' Cathedral on the east side of the south transept. It has been erected to the memory of the late James Bryson. The subject, as laid down in the general scheme of the cathedral windows, is illustrative of the text, which is introduced into the lower part of the window, "They were all filled with the Holy Ghost." The work has been carried out at the studios of Messrs. A. Ballantine & Gardiner, Edinburgh.

THE PARISH COUNCILS.

THE Parish Councils are now elected throughout the country, and with the commencement of the New Year they will have begun their administrative work. We may expect this work to be performed in a very varied manner; in some places considerable energy and intelligence will certainly be seen in the administration of the duties of the Parish Councils, in others it is probable that considerable apathy will characterise their proceedings. In many respects the duties which devolve on these new bodies are not such as fall within the cognisance of this journal. We are not concerned, for example, with the question of allotments. But some of the direct and indirect functions of the Parish Councils touch on matters with which we find it desirable to deal from time to time. The duties of the Parish Councils arise either from what may be termed their actual jurisdiction—that is to say, they come from powers directly conferred on them by the Local Government Act, 1894, or from powers arising under certain Acts of Parliament already known as the "Adoptive Acts," which may or may not be adopted by a Parish Council.

It will be convenient to consider first some of the direct and existing duties of the Parish Council. It may provide or acquire buildings for public offices and for meetings, and for any purposes connected with parish business. This is a power which is hardly likely to be exercised to any large extent for some time to come. It is pretty sure, however, in large parishes not altogether to remain a dead letter. In many large villages where the Parish Council will have to meet at regular intervals, and work will have to be done by committees, the want of a central public building will be keenly felt. We have more than once pointed out the need in every considerable village of a public hall. The power to which we are now referring will enable Parish Councils to provide themselves with a public office, which will also be capable of use for purposes of business or recreation by the village generally. Among the adoptive Acts is the Public Libraries Act, 1892, and it is obvious that if this Act is adopted, some kind of co-operation may be brought into existence between the uses of a Parish Council office and a public library. There cannot be a doubt that the establishing of such a building would be a considerable advance in village life. If it were designed with taste, it would also be a picturesque addition to the architecture of the ordinary village.

Another direct power given to the Parish Council is to provide or acquire land for a recreation-ground and public walks. There is no question that a recreation-ground is desirable in every village. The absence of it is now more marked since the Education Department has paid greater attention to the question of playgrounds in connexion with elementary schools. In this respect the villager is often worse off than many a dweller in a town, who has some public ground within reach, since the former can frequently only move away from a highway by trespassing on some farmer's land. A recreation-ground properly fenced will certainly tend, in some degree, to add to the health and pleasure of the villager, and by so doing help, in some small degree, to prevent the constant exodus from the village to the town.

It is probable that the exercise of the above power will be more popular with the villagers than that given to utilise any well, spring, or stream, and to provide facilities for obtaining water therefrom. This power will, undoubtedly, enable a Parish Council to supply a village with wholesome water. But whether the villager will like to see the well which he has known from boyhood free to man and beast, guarded and properly utilised, is very doubtful. We have over and over again in our "Notes" referred to reports of the Inspectors of the Local Government Board showing how various attacks of sickness in rural places have arisen from a bad water supply. In this respect many of the larger Rural Sanitary Authorities have shown great apathy. It remains to be seen whether the smaller body, the Parish Council, responsible for a very limited area, will show more energy. It will have power also to deal with any pond, pool, open ditch, drain, or place containing or used for the collection of any drainage, filth, stagnant water, or matter likely to be prejudicial to health, by draining, cleansing, or covering it, or otherwise preventing it from being prejudicial to health. This power, coupled with that to which we have just alluded, really gives a Parish Council large sanitary powers: for it is the want of pure water and the presence of foul ponds and ditches which are the two main causes of disease in the villages of rural England. Elaborate drainage schemes are unnecessary and impossible, extensive supplies of water from a distance are equally out of the question. What is needed is that the village should be treated as a properly-managed country house; that is to say, that the water and drainage should be good, without elaborate machinery. Further, under the sixth section of the Act, a Parish Council "shall have the same power of making any complaint or representation as to unhealthy dwellings or obstructive buildings as is conferred on inhabitant-householders by the Housing of the Working Classes Act, 1890." It is unnecessary to refer in detail to the latter Act, but there can be little doubt that its provisions are more likely to be enforced when the Sanitary Authority, now the District Council, may be set in motion by a representative body, than when this could be done by four inhabitant-householders. A householder might have good reasons for bringing the insanitary state of a dwelling before the Sanitary Authority, but he might have difficulty in getting three others to join him. There would be fear of hurting the feelings of a neighbour, and various other reasons. Now, when a member of the Parish Council brings the matter in ordinary course before that body, it may well be that he will receive cordial support. In fact, we regard this provision of the Local Government Act as being likely to have a very considerable effect on the sanitary state of our rural districts. Individual energy will have an easier task than heretofore, for the sanitary areas will in some respects and for some purposes be smaller. The Rural Sanitary Authorities have hitherto by no means done as much as they might have to improve the condition of the villages. Now the village will, to some limited extent, as we have pointed out, be able to manage its humbler sanitary affairs and its own water supply, and it will also be able to put pressure on the District Council, which has now become the Rural Sanitary Authority. On the Parish Councils there have been elected plenty of men of common sense and energy, and we look with confidence to a considerable advance in sanitation—irregular, no doubt, but distinct—through the agency of the recently-elected Councils. It is desirable that some of the special powers given to these bodies should be clearly pointed out, so that there may be opportunity found for their exercise in a reasonable and fair manner without delay.

NEW JUSTICE OF THE PEACE.—Mr. Matthew Wallace, of the Albion Iron Company, was on the 9th inst. sworn in as Justice of the Peace for the County of London, before Sir Peter Edlin, Q.C., at the Middlesex Sessions, Clerkenwell.

RESIGNATION OF AN ENGINEER.—In reference to the paragraph which appeared under this heading in our last issue, page 23, we inadvertently stated that Mr. W. Nisbet Blair, C.E., had been compelled, owing to a serious illness, to resign the office of engineer and surveyor to the Vestry of St. Leonard, Shoreditch. The name should have been Mr. A. N. Hawtrey, now one of the assistant surveyors to the St. Pancras Vestry, of which body Mr. Blair is chief engineer and surveyor. The error occurred owing to the rather ambiguous communication which we received from Mr. Hawtrey himself.

NOTES.

THE reception which M. Chedanne met with at the Institute of Architects on Monday night, enthusiastic as it was, was certainly no more than he fully merited. That his drawings would arouse the highest admiration from English architects when once seen we had never the slightest doubt; but the account read by Mr. Spiers, on the basis of M. Chedanne's Report, of the process of investigation by which the French architect arrived at the conclusion that the Pantheon portico consisted of the original materials of a decastyle portico, used over again for an octastyle one, is one of the most brilliant examples of acuteness of observation and deduction in regard to the constitution of an ancient building, and (what is more) of success in such deduction, that we have heard of, and establishes M. Chedanne as an architectural investigator of the first order. The main points of the process are given in our abbreviated report of Mr. Spiers's communication, and the chain of reasoning and of facts appears complete and impregnable. Another new fact was brought out on the same occasion, as it appears that the dome of the Pantheon is after all in fact built of brick; but of brick in level courses and not in domical form. The conclusion of Professor Middleton, that the dome was only a mass of concrete, is thus negatived in regard to the mere material and the method of disposing it; but it does not seem to have been quite sufficiently recognised that this is more a difference in detail than in principle, and that the English archæologist was right in the most important point; viz., that the dome was constructively not a dome at all in the proper sense. Whether the materials were the irregular rubble used in concrete, or whether they were shaped bricks built flat, it is quite certain that the stability of the dome depends mainly on the cementing material. A properly-constructed dome could, with care, be built without any mortar, though practically its life would probably be rather precarious; the Pantheon dome assuredly could not have been so built. In a historic sense it is of interest to find that, at the period when they could carry out so bold a piece of work, the Romans really did not know how to build a dome at all; but one can hardly say that the result of M. Chedanne's investigations increases one's respect for the builders of the Pantheon. It is but a clumsy and rule-of-thumb piece of construction that has been unveiled to us; and if the dome had really been constructed as Viollet-le-Duc and M. Choisy too hastily concluded that it was, one would have felt a good deal more respect for it as a construction. Architecturally no doubt the building is (internally) one of the noblest conceptions in existence. It is worth note that the interest of the subject, and the fame of M. Chedanne's drawings, has to some extent excited the attention even of the daily press of this country—usually so stolidly indifferent to everything in the shape of architectural achievement or investigation.

THE German Archæological Institute at Athens has just issued its full programme for the two archæological tours to take place after Easter this year, and as foreign specialists are admitted a summary may be of interest to our readers. The first tour, through the Peloponnesus, begins on Easter Monday. A day is spent in succession at each of the following places:—Corinth, with Nauplia; Tiryns, including the recently excavated Heraeon at Argos; Mycenæ, Epidauros, Argos, with Tripoli; Mantinea, Megalopolis, Lykosura, Bassæ, Samikon. This brings us to Olympia, where a halt of four days is allowed, at the end of which the bust of Professor Curtius is to be unveiled in the Olympian Museum. After Olympia the party proceeds to Patras, and thence in a private steamer to Itea, for Delphi, where the last two days will be

spent, and Athens will be reached on April 30. What combination can do is shown by the fact that the cost per person is estimated at ten marks a day, whereas the ordinary private traveller, with his dragoman, must expect to pay about forty. Dr. Dörpfeld is always good for a five hours' lecture per diem, but the weaker brethren will be glad to learn that before the "island journey" begins, on May 6, they have five days' rest at Athens. The second programme is as follows, and as it is entirely performed in a private steamer it will be far less exhausting:—Ægina and Poros, Sunium and Thoricus, Oropos and Eubœa, Rhamnus and Marathon, Delos, Mykonos and Assos, a whole Sunday at Assos, and two final days for Troy. Troy and Assos are only provisionally advertised, in case there is no Turkish quarantine. The "island journey" is to cost about sixteen marks a day, and ladies may join it. It will be seen that the two journeys cover the whole field of recent Greek excavations.

MR. T. G. JACKSON'S letter in our last issue upon the subject of the obstruction of a certain air space in the rear of a building at Wimbledon by a new erection connected with the original building, carried on the controversy raised in the *Times*, upon which we made some comments in our issue of the 5th inst. According to Mr. Jackson's last statement the original air space has been largely curtailed by a block of buildings lately erected. This has been allowed by the Wimbledon District Council on the ground that it is an addition to an old building, and not a new building, and so not within the meaning of the by-law in regard to air space behind a new building. As we previously pointed out, it is almost impossible, from our point of view, to form an opinion on the propriety of the action of the Wimbledon District Council without a complete knowledge of all the facts of the case. It is obvious, however, that in the public interest the particular by-law should be strictly construed, otherwise it may often be reduced to a dead letter. Without in any way affirming that it would be a test of a new building, we may, however, suggest that where a new foundation is placed in the ground beyond the area of the old foundation, for a purpose other than something clearly in the nature of a new addition, such as a bow-window or a porch, that circumstance may to some extent furnish a reasonable test. But it must further be pointed out, that according to Section 157, Sub-section 3, of the Public Health Act, an urban authority may make by-laws "with respect to the sufficiency of space about buildings, to secure a free circulation of air." If, as we presume is the case, the particular by-law of the Wimbledon District Council is made under this section, it appears to be worded in too narrow a manner. The by-law speaks of new buildings; the word "new" should be omitted, so that the space which is required behind a building when first erected should not be diminished by any kind of erection, even if it be a mere addition. The Act clearly contemplates a permanent air space, it does not mention the word "new," and we can see no reason why the Wimbledon Authority inserted the word "new" in their by-law. But if the original or "old" building, to which Mr. Jackson refers, was erected since the by-law came into existence, then it would appear that there has been an infringement of the by-law, which is intended, unless it is to be useless, to compel the maintenance of a certain air space behind a building when it is erected. This air-space once having been given remains an adjunct to a building, otherwise there may be an air-space behind a building for twelve months after its erection, and then the owner might build on it a so-called "addition," and defend his action on the ground that the by-law only requires an air space to be given to a new building, and not to an addition. This latter point of view does away with the need for considering if a structure is a new building or an addition, and it appears to be the only way in which the objects of the Act can be attained.

ALMOST simultaneously with the verdict of the coroner's jury in the Chelford railway accident, we have the Government Inspector's reports upon the collisions at Carlisle and Northallerton. Major Marindin's remarks with regard to the latter fatality cannot be very pleasant reading for the North-Eastern Company. The Chelford disaster might, doubtless, have been prevented had the station-master realised that the shunting operations were being carried on under such very exceptional circumstances, that exceptional precautions were needed to ensure the wagons remaining where they were placed. But at Northallerton the accident was due to lack of ordinary precaution, and the blame does not rest upon one official only. It will be remembered that during a fog, an up Scotch express, drawn by two engines, ran past several danger signals and into the rear of a goods train, the driver of the first engine being killed, and several passengers injured. The Board of Trade Inspector holds the dead man primarily responsible, but considers the other driver should have kept a better look-out; and, further, that when the fog came on, the speed of the train should have been much reduced. The fog-signalling arrangements of the North-Eastern are adversely commented upon, also the method of marshalling the carriages, and the overloading of the already delayed goods train. Finally, the action of the Westinghouse brake is pronounced unsatisfactory—so far as reducing the speed of the train is concerned—although it is spoken of as having done good service in confining the damage to the first few vehicles on the express. No railway company should be content with less than perfection, as near as may be, in the vital matter of fog-signalling, and we have no doubt that the North-Eastern will have already taken steps to improve their system where it may have been found inefficient. As to another suggestion made by the Board of Trade Inspector—the duplicating of main lines in order to ensure a clear run for expresses—this is one of those expensive improvements in which the pressure of competition often provides a keener spur than considerations of public safety; but it would be very satisfactory if Major Marindin's recommendations should induce the North-Eastern directors to give this matter their early attention. It may be safely asserted that those companies who have already duplicated large portions of their main lines will never regret the outlay, and if the North-Eastern Company were before inclined to hesitate, the accidents at Thirsk and Northallerton should serve to convince them of the desirability of taking Major Marindin's advice.

THE discussion in the London County Council on Tuesday in regard to the cost of painting Hammersmith Bridge should not be passed by without notice. In 1893 the Council decided to have it painted at an estimated cost of 1,000*l.*; 505*l.* was subsequently added to this estimate for extra work. The work was done by the Works Department of the Council, the final cost amounting to 2,186*l.*, or an excess over the estimate of 681*l.* If this extra cost had been incurred by a contractor, we should never have heard the last of it. Now that the estimate is exceeded by the Works Department of the Council it is passed over, though the excess cannot be defended. The work was of the simplest possible kind. So far as it is possible to gather from the discussion, the chief cause of the excess was that the work was done in the winter months; in other words, the ratepayers' money was wasted by work being done at the wrong time of year. Moreover, if the estimates of the Council's officers are thus exceeded, what value can be placed on them at all in regard to the relative cost of work by the Works Department and by independent contractors? It was further admitted that the bridge was painted in 1888 for 855*l.*, and it was not in the least shown that the work was not then satisfactorily performed.

NOT many weeks ago the panic at a Belfast children's entertainment gave an opportunity for a general outcry as to the inadvisability of filling public halls with children unaccompanied by adults. Now, in our very midst, at the Charrington Hall, Whitechapel, we three times successively last week see some 6,000 or 7,000 children literally packed together, with only some sixty adults present. Of these some thirty figured on a conspicuous, but distant, platform, and thirty were distributed among the children. The age of the children averaged nine years. The occasion was a most kindly-arranged treat by the *Pall Mall Gazette*. Is our contemporary, however, aware of the risk, and has the County Council no power to prevent recklessness of this kind? The hall is lighted by gas, and effects were tried by suddenly shutting off the supply and then showing off a Christmas-tree lighted by electricity. Surely that was simply playing with danger. On Friday there was quite a marked gas-escape near the platform.

THE letter of Mr. Redgrave to the *Times* (concerning Portland cement), to which we alluded a fortnight ago, has evoked several replies. The greater part of Messrs. MacEvoy & Holt's letter is practically identical with a communication from them which has recently appeared in our own columns, but in conclusion they traverse Mr. Redgrave's statement as to the inertness of cement grains which are too coarse to pass a No. 80 sieve.* The experiments quoted by them, however, show plainly that such grains are of far inferior value to the fine flour of cement, and the experiments are certainly not enough to upset the conclusions to which many unbiassed engineers have been independently led. Indeed, Mr. H. K. Bamber, F.I.C., in the *Times* of January 7, goes so far as to say, that "it is a fact that all the cement which will not pass a 180-mesh sieve [=32,400 meshes per sq. in.] is quite useless as a cement, and is no better that so much sand, if so good"; he adds that this inert matter amounts, "in cements ground to leave 10 per cent. residue in a 50 sieve, to about one-half the weight of the cement." The value of fine grinding is now universally acknowledged by engineers and architects, and Messrs. MacEvoy & Holt would do well to confine their attention to the real question at issue, which is the effect of the addition of ragstone, or other materials, to Portland cement after calcination.

THE German genius for statistics is illustrated in a registry in connexion with population and house property at Berlin, on a plan which might be of some value if carried out in this and other capitals also, and assist house-builders in fitting supply to demand. At Berlin the increase of population, new houses, empty tenements, rise and fall of rents, mortgage transactions, &c., have all been registered by Herr Fränkel, who has arrived at the following results:—Berlin, on January 1, had about 1,724,500 inhabitants; there has been an increase of 34,000 souls during 1894; there are 22,698 sites in Berlin which have buildings on them, but there were only 231 new sites built upon last year; the total value of house property in Berlin is about 170,000,000*l.*, this figure being taken from the books of the municipal insurance office which enforces policies on all structures (as distinct from contents); there are over 33,000 empty tenements at present in Berlin; there

* That is to say, a sieve with 80 meshes per lineal inch =6,400 per sq. in.

were only 30,000 vacant at the beginning of last year. In about 10,000 cases landlords lowered their rents last year. In 2,300 cases the rent was raised. During the year no less than 232,000 families moved into other tenements. There are altogether 449,000 tenements in Berlin, the rental value of which is about 15,000,000*l.*, this figure being taken from the lists of rents actually paid. There were 3,000 conveyances of house property last year; of these 2,000 were by treaty and 400 by compulsory auction to recover mortgages. No less than 29,000,000*l.* were lost by mortgagees last year, who had lent too highly on property. In 1893 23,000,000*l.* were lost, and in 1892 19,000,000*l.* Members of the building trades keep a register of bad debts in connexion with a black-book. The total owing to them is about 300,000*l.* Berlin house property is at present mortgaged to the extent of about 200,000,000*l.*, or 30,000,000*l.* above the actual value according to the insurance books.

IN his annual report to the Vestry of St. George, Southwark, Dr. Waldo, the Medical Officer of Health, touches on a great many points of contact between the responsibilities of the medical man and the building-owner or architect. Density of population is found to be directly connected, in his district as elsewhere, with high death-rate, and "density of population is materially augmented by a number of large and densely-crowded buildings which exist in all the sub-districts. These are the so-called 'model' dwellings." Among the existing causes of diphtheria are said to be "close aggregation in schools, with insufficient ventilation and floor space," and "aggregation in block buildings and on their staircases and courtyards." Erysipelas thrives best "where dampness, want of light, and stagnation of air are combined. The infection is commonly spread in underground basements." The water-cisterns of the "model dwellings" in the parish have been the subject of special examination. The following is Dr. Waldo's statement on this head:—

"The cisterns were, for the most part, on the roofs, often imperfectly covered in, and in most cases within a few feet of the openings of the soil-pipe ventilators.

The latter condition renders the water liable to contamination by sewer poisons, and in this way might sow broadcast the germs of diarrhœa, typhoid fever, and cholera.

The water in the cisterns was frequently filthy, its surface covered with smuts from the chimneys, and in a few instances with a layer of decayed vegetable matter 2 in. deep, while the sides of the cisterns were coated with slime one-third of an inch in thickness.

Many foreign bodies were found in the tanks. It has been reported to me that a boy was seen to wash his face and hands with soap in a cistern supplying a block. In all necessary cases I have served owners with notices calling upon them to remedy defects. Constant supervision, however, will be necessary to compel owners to cleanse periodically and to keep in repair the cisterns. In private dwellings I find an equally bad state of affairs. The cisterns are often badly placed, as, for instance, directly over water-closets or in areas near the dust-bins.

In a few of the 'model' dwellings I have induced the owners to supply water direct from the rising main. The cisterns, periodically cleansed, supply the water-waste preventers in the water-closets, and in times of need only, a screw-cock attached to the head of a pipe coming from the cistern and joining the rising main, affords a temporary and secondary supply. This system, particularly with a constant supply, is found to work admirably in practice.

This plan, however, cannot be applied in the case of lofty 'model' dwellings supplied by the Southwark and Vauxhall Water Company. The reason for this is that the company fails to carry out the obligations to provide water at the pressure clearly laid down in the 'special' or private Act, which would more than reach the highest flat in Southwark."

The portion of the Report dealing with sewage-flooding in basements is serious reading. Owing to the inadequacy of certain main sewers in the district, cellars in which food is stored or prepared for human consumption have been, and may be again, flooded to the depth of as much as two feet. In reference to this matter a correspondence took place between the Vestry and the London County Council. The latter suggested that the less costly remedy would be to fill up the cellars, rather than to enlarge the main sewer. No mention was made, however, of the question of compensation for disturbance to owners, nor did the Council state on whom it was proposed to lay the necessary costs involved by filling up the cellars. Further, no answer of any kind was given to the proposal contained in a previous Report that the Council should lay down a separate system of drainage for carrying off storm water. So there the matter remains.

IN a paper entitled "A Note on the Construction of Hospital Wards," read by Mr. John Sulman before the Adelaide meeting of the "Australasian Association for the Advancement of Science," a suggestion is made in regard to hospital wards in very hot and bright climates, for the provision of direct sunlight in sufficient quantities without foregoing the advantage of a verandah in keeping the walls cool. "External verandahs," says Mr. Sulman, "which cover both windows and walls, are effectual against heat and glare, but fatally defective in permanently cutting off the direct rays of the sun. A modification of this system, as seen at the Prince Alfred Hospital, Sydney, and elsewhere, is the reduction of the height of the verandah so that a small upper window gives direct admission to sunlight, and the remainder of the window and wall space is permanently shaded." In hot climates where there are nevertheless frequent cloudy days when sunlight is interrupted, Mr. Sulman recommends covering the greater part of the window by a movable hood, let down when the sun is powerful, and drawn up at right angles to the window when its glare is mitigated by clouds.

MR. C. WELCH, F.S.A., Guildhall Librarian, will edit, for the London and Middlesex Archæological Society, their reprint of what is commonly known as Ogilby's Map of the City, 1677, engraved, in part, by Hollar. The map, "made by John Ogilbye, Esquire, and William Morgan," is dedicated to the Corporation by the latter, "his Majesty's Cosmographer." On a scale of 1 in. to 100 ft., and measuring 8 ft. 2 in. by 4 ft. 2 in., it plots every separate building. The Corporation possess a MS. index, which gives a particular account of the streets and lanes in the City and liberties, directions for finding all the courts, yards, and alleys, churches, halls, and houses of note, and the name and marks of the wards, parishes, and precincts: this index, we understand, will be included in the reprint. An edition of the map was brought out, in eighteen sheets, by Robert Morden and Philip Lea, in 1732; a later one by De Wit. Whilst devoid of the skilful draughtsmanship which distinguishes modern cartography, Ogilby's map is a highly valuable piece of work, especially as being the first drawn upon so detailed a scale when they had begun to rebuild London after the Great Fire. But in saying that "nothing like it was attempted till the Ordnance Survey was made in this century," our usually well-informed contemporary, the *Antiquary*, seems to overlook the labours of, at least, Rhodes, Horwood, and Rocque. R. Horwood's survey of London, Westminster, and Southwark, about 2 ft. 1 in. to a mile, was published in thirty-two sheets in 1794-9, Ash being the engraver. It is dedicated to the trustees and directors of the Phœnix Fire Office, and is remarkable for the insertion of postal numbers of the houses, all of which are separately plotted, with their gardens, forecourts, &c., and in many cases their names. Horwood devoted great pains to his work: he undertook to prepare more detailed plates for those who might wish to have them, and announced his readiness to—

"Make new setts of Impressions to show changes in numbring if the Commissioners appointed for that purpose and the Parishes think proper at any future period to make a regulation in the numbring."—(*Vide* the title-sheet.)

In 1807-13 W. Faden brought out a further edition, in forty sheets, and in 1819 a fourth edition, with additional area, of Horwood's map, "in which every dwelling-house is described and numbered." John Rocque's surveys extend over a few years in the middle of last century. His big survey, with a contracted plan for key, was engraved by John Pine, Blue Mantle Pursuivant, and chief engraver of seals to the King, in 1746, and was published also in colours; it forms the basis of Pine and Tinney's map, 1749, engraved by Basire and Seale, and of another, 1754, issued by Pine, Tinney, & Bowles, successors to Rocque's property in his original survey. J. Rhodes's view of Kensington, and the Gardens, Hyde Park, and Knightsbridge, engraved by J. Bicknam, and published July, 1766, is a striking performance, on a scale (about 40 in. to a mile) large enough for the delineation of every house, with doors, windows, chimneys, railings, and so on. Of Ordnance Surveys of London a skeleton-plan, 5 ft. to a mile, was published in 1848-50, and another, 1 ft. to a mile, in forty-four sheets, in 1850; the former, with the houses, &c., filled in, and historical sites down to 1688 marked, was issued in 326 sheets in 1871.

WE have received a circular in regard to a so-called "Art-Furniture Exhibition," to be held at the Agricultural Hall, from April 16 to 22. The following are stated as some of the objects of the exhibition:—

"The Exhibition is a commercial undertaking, organised for a business purpose; it is intended for the improvement of the relationship between the actual seller and the actual buyer, and to bring both in closer contact with one another; it is an opportunity for bringing principals in personal contact with their own customers, and many others who are not at present transacting business with them; to continue the important feature of bringing together under one roof every buyer and seller of furniture," &c., &c.

Where does the "Art" come in? Not a word as to the object of improving the design of "Art-Furniture"; not a word as to those who design and those who make the furniture; they are not taken into account at all. The whole thing is apparently a public installation of the middleman; and we wish it—exactly the success it deserves.

IT was worth while to make the exhibition of the collected drawings of Rowlandson which are now on view at the Society of Fine Arts Gallery, in Bond-street, as representing the work of a man who held an important place as a satirical artist in his day. But the impression left by it is not an agreeable one. Rowlandson was the Swift of pictorial satire, whose object seemed to be to throw contempt on human nature, and to represent men and women only in an odious and disgusting light. There is unquestionable power in many of his caricatures, and perhaps some of them, such as the picture of "Jolly Jack Tars Carousing" (242), are (for their own day) not so very far from the truth. Others, such as "The Turtle" (8) are obviously monstrous and cruel exaggerations. Some of the portraits, especially that of "Miss Farren" (48), show a great deal of power of characterisation. In his sketches of town and country, many of which form the backgrounds to scenes illustrating the life of his day as he saw it (or affected to see it), Rowlandson shows a happy freedom in representing scenery and architecture in a light sketchy manner, conveying a great deal with little labour; and he handled his own method, that of pencil or pen sketching with light tinting, with knowledge and ready ability. But in general, whether we regard the exhibition from the artistic or the humanitarian point of view, it is one that we feel rather glad to get away from.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of this Institute took place on Monday last, at No. 9, Conduit-street, Regent-street, the President, Mr. F. C. Penrose, in the chair.

The minutes of the last meeting having been taken as read,

The President delivered the following address to students on "The Study of Buildings To-day and in the Past":—From the two preceding Presidents you have received at this period of our Session addresses of high professional value. These addresses, and especially the three last, occupy so large a field of the practical requirements of students, and I may say, not of students only, but of fully-fledged architects also—for indeed we should all be classed as students, and be brought within the definition which Michelangelo gave of his own position when he answered someone who wondered at seeing him, in the zenith of his fame, busy measuring a piece of antique detail, "I also am a student"—that it would be unnecessary and undesirable for me to enlarge upon it. I cannot, however, avoid repeating here and there what Mr. Anderson has so admirably brought before you, as when in his first discourse he rightly claimed for Planning the title of an art—for an art it is, quite as much as when a sculptor tudies the anatomy and the skeletons of the figures of his groups, or when a landscape painter arranges the articulation of the limbs and trunks of the trees which he proposes to cover with foliage. I would strongly advise the younger students who did not hear the discourses I speak of, to refer to those numbers of the *Journal** which contain them, and not only to the address on planning which I have mentioned, but also to those later addresses on the reciprocal duties of students and commencing architects, to their teachers, their work, their employers, their professional brethren, and to themselves—qualities affecting character which are quite as necessary to success, or even more so, than intellectual or artistic power and learning.

Under the new regulations, a very important matter to any one entering the profession must necessarily be the examinations, which he must pass to qualify him for a place, in this Institute at any rate—and it is not unlikely that something analogous will practically come to be required of all architects. Care has been taken to make these examinations, whilst being a fair test of efficiency, yet not so severe as to be an inaccessible bar to any whose talents show real sympathy with the profession of architecture; so that the passage shall not be an obstruction to any one who, although only moderately endowed with natural quickness, is willing to entertain the one thing needful alike to him as to one with an intellect of the highest order, namely, fondness for the profession as the great aim in life, and the determination to secure the necessary steps by careful and continuous study. But it should be borne in mind that, important as is the passing of the examinations referred to, they should be considered not as the final end in view, but as the means of attaining it. And I specially mean by this observation that work of the nature of cram is to be discountenanced. The examination questions are very properly published in the "Kalendar" as a guide to the sort of examination which the candidates are to expect; but it would be a very bad preparation to dwell too much on the confines, as I might call it, of such published questions, instead of study of a broader description. The examination may easily take such a turn as to defeat a partial preparation; but a candidate who has a good general knowledge is much less likely to be nonplussed. But whatever subjects are studied, whether in a broader or narrower circle, should be fully assimilated.

Dismissing these remarks on the door of admission to our ranks, I will endeavour to place before you some considerations which long experience has led me to think essential to success in design.

The very first thing for a student to acquire is the power of accurate drawing, the obedience of the hand to the eye, and the ready manipulation of the instruments he uses. These may have been already partially attained; if so, so much the better; but it is indispensable. I will suppose the student entering an architect's office. If in that office there are, as is probable there would be, clerks and senior pupils, the natural modesty of youth will perhaps inculcate an amount of shyness which will hinder him from gaining from them, at first, sufficient information as to the meaning of what is going on; but in ordinary cases this shyness soon wears off, and he will find his seniors ready to give information, especially if asked for at convenient times. This manner of study was practically the only one available to aspirant architects when I first began my studies, and very few books were usually accessible. The only book in the office where I was a pupil was Peter Nicholson's Dictionary—a book I by no means undervalue, but mention to show how limited our literature was in those days. It is very different now. The extensive library of the Institute is open to you, and there are lectures of all kinds which you may attend. Still, the value of the instruction in an architect's office, especially in practical matters and construction, still remains where it did, as well as the advantage of the friendships which may be formed there with fellow pupils.

Passing through the copying stage, you will begin to sketch, whenever opportunities offer, from existing buildings. In visiting works in progress do not be shy of asking the clerk of works the meaning of what you see. You will seldom find him disinclined to give information. Some of you doubtless will join in the pleasant and profitable Architectural Association excursions. In these I may venture to offer some advice to students, drawn from my own experience at this stage.

Suppose you have come to study some ancient building of merit—I do not mean that the term would not be equally applicable to a modern building; but ancient structures are more attractive, and more likely to be visited for detailed study. The first inclination would be to get a note or sketch of everything that takes the fancy; and I find in my early sketch-books pages and pages of different objects too slightly drawn, and only now and then is there a subject sufficiently explained to be a proper memorandum of what I saw, and which then attracted my attention so much. It is better, instead of rushing to work in this way, to spend some time in the general examination of the building, and to write down as concisely as possible, in a clear hand, and not too small (remembering that the keenness of youthful eyesight does not last for ever), what you think to be the chief characteristic of the work before you, and not till then devote such time as is available to sketching. Try to make your sketches as accurate and clear as you can. If there is time for a general view to be finished adequately, it may possibly be the most valuable; but if not, choose such piece or pieces of detail as can be properly rendered. Endeavour to get an accurate outline, together with plans and sections of mouldings; never mind how much time and how much use of india-rubber it may require, rapidity and artistic effect will come with practice. Leave your sketches alone when you leave the place; or should any relaxation be allowed to this rule, it should be limited to what may be done at the first resting-place, before the distinct impression produced by what you have endeavoured to portray has been effaced from the mind. This distinct impression can hardly ever last more than a few hours.

We may ask ourselves, what is the great value of this power of sketching? Is it to store up plenty of material for copying? In respect to new designs, certainly not. For restoration of ancient buildings—on which I propose to make some further remarks—no doubt such sketches would be of great service, so far as they are accurate. The chief value of the power of sketching in designing new buildings I conceive to be twofold: one is, that facility in sketching gives an architect readiness in designing in perspective concurrently with his geometrical elevations and sections; but the main advantage, as it appears to me, is that from familiarity with his own rendering of an existing building he can realise better the effect that a design from his own hand will have in execution. For this end you will see the high importance of accurate representation. Picturesque treatment is quite another thing. If the drawing is both accurate and picturesque, so much indeed the better; but of the two, accuracy is the needful quality. A design cannot win true excellence unless it is right both in form and colour. Form is the more important of the two, but injudicious combination of colours may spoil a well-formed design. When simple materials are used the colour can seldom be wrong; but when stronger contrasts are attempted, much care will be necessary. In sketching from nature, including buildings, too much attention to colour is apt to induce carelessness in respect to form. One of the finest and most truthful artists both in form and colour as a landscape and architectural painter I ever knew, the late Rev. John Pettit, was so much aware of this tendency that for three years of his earlier work he denied himself altogether the use of colour, and drew simply in monochrome. In studying a design where much colour is proposed I would recommend a complete representation in monochrome before any coloured drawing is made.

It may be said that in architects' competitions the picturesque style prevails, and is most telling. I believe that the committees who invite competitions are becoming aware of their weakness in this respect, and it is now not unusual to find among the conditions that "only geometrical drawings" are required.

During the earlier years of his education (whatever he may feel inclined to do afterwards) I should advise the student to make no use whatever of photographic apparatus. His object should be to impress the forms he sees upon the mind, to educate the hand to follow the mind's conceptions with rapidity and certainty; not merely to store up examples in portfolios, which can be of very limited use to him in comparison. I am not referring to collections of photographs by others, but to his own particular study.

Besides drawing and the practical studies of construction, &c., there are some subjects which the student should recognise as not unconnected with architecture, though any particular study of them is very rightly scarcely even suggested in the curriculum recommended in the "Kalendar." I refer particularly to two of these, which are very fascinating subjects for research, namely geology and archæology, using those terms in their fullest sense. I am far from meaning that a student can be properly equipped if he is quite ignorant of those subjects; for no proper knowledge of masonry can be altogether independent of geology, and the knowledge of the different characteristics of Classical and Mediæval architecture is not attainable without an acquaintance with general principles of archæology; but the more detailed researches in such subjects may, for those whose inclination leads them to it, be left for future leisure—and, as "the wise housekeeper will bring forward out of his treasure things new and old," it will not be without profit for him to do so; but the old is mainly valuable for the sake of the new. Good architecture in all time has been the development of what has gone before, and unless the new is well keyed into the old, there is no reasonable prospect whatever of success. Too close an adherence to the past is also to be deprecated, but on different grounds. There is, however, one exception to this last remark. I refer to the case of those who may be engaged in the restoration of churches and other ancient buildings. In works of this nature archæological conditions should be paramount, or only controlled by the requirements of divine service or other necessary use; but it should be historical archæology, and not selective. In restorations it is scarcely possible to be too conservative. It has not unfrequently happened in church restorations that valuable historical links have been sacrificed to the preference of the characteristics of some particular period. True loyalty to historical succession, and attention to the advice given in the papers on the subject which have been issued on the authority of the Institute, will almost always point out the right path; but as cases of difficulty might arise, I should recommend a commencing architect, who finds himself face to face with a difficulty of this kind, to put himself in communication with the department of the Institute under which this subject has been considered; and from this body a *bonâ-fide* communication would be sure to receive a courteous and careful reply. If additions have to be made to old buildings of various styles, the circumstances will generally point out which of these styles ought to be followed. The architect, however, should not allow individual fancy to prevail too much in selection, but should endeavour to put himself as much as is possible in the position of a surviving partner to the designer of the original building, and should think at least as much of his predecessor as of himself. In new creations of his own, carried out in any recognised style, I would by all means advise him, whilst inspired and guided by archæological teaching, not to allow himself to be confined and hampered by it. The new materials and means now available cannot but lead us, as years go on, more and more away from the past; but to succeed it must be done, not by revolution, but by evolution.

To sum up in a more succinct manner what I

* The addresses have also been published in the *Builder*. —ED.

have said on this subject, the student and commencing architect should be so far an archæologist as to study and endeavour fully to understand the development of the Classical styles of architecture from the best Greek period to the Decline. The Roman variety, with its important accessory the arch, its earlier and better phases, and final corruption. The Mediæval styles which followed, especially our English development from the Norman to the Tudor, taking cognisance also of the associated arts of sculpture and painting of those periods. But with respect to the special domain of antiquaries, such as painted vases, paleography, coins, jewels, and heraldry, he must remember that art is long, and life short. Nevertheless, should his inclination lie that way, there is no reason against his indulging in the hope that at some future time he may have leisure for a more complete examination of them. If architecture be well studied, practically and historically, sufficient general knowledge on the necessary archæological points connected with it will come in its train. A detailed knowledge will not assist him in his art, and it may absorb time better employed—at first, at any rate—in practical construction. I have no desire to undervalue the study of archæology proper; but as it has become a much more favourite study than formerly, and is itself an engrossing and fascinating subject, all I wish to do is to point out that it is not one of the primary desiderata for our students, except so far as it comes to him in connexion with the history of architecture. One of the more abstruse parts of this, as well as the other allied sciences to which I have made allusion, it is better to be content with the advice of specialists when occasion for it may arise.

One of the most important considerations at the outset of architectural study is to entertain sound notions respecting materials, not only as regards strength and durability, but as to their proper employment; and this is especially the case when we consider the number of new materials which are now available. I am not advising the patronage of novelties, but of such as have already won the favour of practical men. In actual building it is well to remember that whilst studying all reasonable economy, which is a duty in almost every case, sufficient solidity of construction and well-chosen material, and a good shape, which generally involves but little, if any, extra cost, are far preferable, and will give more satisfaction both to the employer and the general public, than any effect to be obtained by ornament. To give a simple illustration: a plain chimney-stack, surmounting a roof of good thick slating, is far more effective than an elaborately panelled stack rising from a covering of the flimsy character of which we have now too much in the market.

In the earlier part of this century there was a great abuse of stucco and Roman cement, which were used in situations quite unfit to endure the action of the weather and the test of time. Fluted Corinthian columns, with their base mouldings and capitals and other enrichments, were constantly executed in these materials, so much so as to have provoked a pasquinade in travesty of the compliment paid to Augustus for having found Rome brick and left it marble.

> Our George he did the same, but did in faster;
> For he found London brick, and left it plaster.

This skit, and the stronger artillery used by A. W. N. Pugin in his "Contrasts" and other writings, brought in the desire for more truthful materials, and plaster had to retire from the field in all works of any character, or at least to the more congenial atmosphere of interiors. The reaction against stucco, however, was carried to such a degree that it has been dispossessed of even its legitimate field, that of clothing plain brick or rubble walls, for which it was frequently used by the Greeks, the Romans, by the great architects of the Italian revival, and constantly in Mediæval works—for instance, by William of Wykeham—as an external coating of flint-walls. Plaster surfaces should indeed never be used so as to pretend to be anything different from what they are; they should only be employed when desired to cover rubble of uneven brickwork, and when so treated should not be blocked in imitation of ashlar masonry. For such restricted work as this the architect will have a good argument to offer, drawn both from reason and authority. To the complete oscillation of the pendulum of fashion away from the over-use of stucco, I attribute a great mistake which has often been made in church restoration, in which we too frequently find that the rubble walls of the interior have been denuded of their original coating of plaster, a covering which in ancient times was frequently adorned with frescoes, and which might very properly be so treated now; and the walls so exposed exhibit a very forbidding aspect of confused pointing and general untidiness. But pray consider that, whilst I am calling your attention to the one legitimate use of this material, namely, stucco, I wish to object as strongly as any one possibly can against its improper employment. Let everything which has to endure strain and pressure or the searching of the elements be of better material, as well as everything that is to show the hand of the artificer in carved or moulded work; which had better be left out altogether than be displayed, in external work at any rate, as mere cast repetitions. I do not include terra-cotta in this general condemnation. It is not a new material, though its extremely fashionable (and, I might add, hackneyed) use is comparatively new. The objection to the mechanical repetition so disagreeable in plaster enrichments does not apply so strongly in terra-cotta, because in the kiln a certain amount of variety is produced, and therefore both on this ground and because of its greater durability it is much freer from objection; but I consider that it should be used with greater reserve than it often is, and with more consideration for the fitness of the material with which it is to be associated. It may combine with an exterior otherwise mainly brick with excellent effect as a superior quality of the same nature. The old houses at East Basham, Norfolk, and Sutton Manor, near Ripley, in Surrey, are good examples of this kind. I do not think, however, it should be used in combination with rubble or flint walling; and I think also that it is out of place when the general effect is supposed to be of masonry, but with terra-cotta simply substituted for stone. But it is in the proper employment of steel and iron, where chiefly the new materials demand the exercise of thought; and this question becomes every year more prominent. Iron has become admirably useful, and is constantly employed as a concealed material; but the time must come before long when for some classes of building it will have to take its own place in architecture; and the best way to meet this requirement may very fitly occupy the thoughts of the rising generation of architects. I do not pretend to have any practical suggestions to offer—I have never had to grapple with the problem. I am inclined to think that the proper treatment of shop fronts will bring about the solution; for there is now a marked contention between the ground-story, where every possible square foot of plate-glass is demanded, and the more usual and quasi-domestic character of the super-structure. Nothing is more dreadful in appearance than the façades which we often see with a display of solid architecture, where the orders and pedimented windows seem to rest, as if by magic, upon a surface of plate-glass, occupying the whole breadth of the front at the street level. In this contention the shop-front must, I think, carry the day, and the old-fashioned form of the upper stories will have to yield. How this is to be done I do not venture to advise, but it will, I believe, rest with you, gentlemen—our successors and, as I hope, successful future Fellows of the Institute—to work out the desired result. This you will do by always aiming at using building materials in the most natural way, and then truth of construction will produce a satisfactory result if directed with the intelligence which grows from proper study and a feeling for proportion.

The Institute has recently received in trust, through the liberality of the Duke of Devonshire, a fine collection of drawings by some of the old masters in architecture. I think it may be of advantage, for the purpose of directing still further your attention to them, to give a running description of some of these. There are several portfolios containing drawings by Palladio, the greater number of which seem to be authentic works by his own hand. There are also some by Vignola and some by Inigo Jones; all these deserve your attention. The larger part of Palladio's drawings consists in a very complete series of the ancient remains existing in Rome in the middle of the sixteenth century, and particularly the remains of the Baths. What I chiefly wish to remark upon is the style of drawing in these works.

The buildings are all carefully planned with a good supply of the leading dimensions. The principal lines only—including, however, everything of importance with reference to the general masses—are shown. There is no confusion. Soffits are never indicated by dotted lines. In the elevations and sections, tints, usually brown, perhaps sepia, are frequently used to denote shadows and recesses—pen-hatching more rarely; but whenever used, very lightly drawn, so as not to obscure outlines. When the scale admits of it, columns and entablatures are carefully drawn, and great pains must have been taken to insure the exactness of the proportions. The capitals and bases of columns are very cleverly indicated, so as to suggest roundness in mere outline. Portfolio VI., which treats of the Baths of Antoninus, has some admirably-drawn columns and entablatures to a good scale, with full detail of enrichments, with measurements and plumbs (in fact, complete working drawings); but there is no aim at picturesque effect. They are exactly what a carver would wish to have. No. VII. is devoted, for the most part, to the Baths of Agrippa, of which the existing Pantheon formed an important part. This volume is chiefly remarkable for a bird's-eye view of Rome, with the buildings and ruins that existed in 1562. It shows St. Peter's in an unfinished state, with the drum of the dome in progress.

In Portfolios XIII. and XIV. are drawings of buildings designed by Palladio. In these we shall find some by his own hand, treated exactly as the drawings of Roman remains previously mentioned; but there are some drawn more mechanically. Amongst the latter are some made for the cloister of the "Convento di Carita da Andrea Palladio, Architetto, par Antonio Vesentini Veneto." In, this portfolio is a geometrical elevation of the Church of the Redentore at Venice, scale of about 1 to 50, thoroughly well outlined, and a Corinthian and composite cap, evidently by Palladio himself, as complete as those already described in Portfolio VI. The portfolio also contains the designs for the famous Olympic Theatre at Vicenza. The principal drawing is rather roughly treated, especially as to the sculpture; and also a more mechanical version of the same by another hand.

Portfolio XVII. has several elevations sufficiently well drawn. One of a rusticated ground story could not be better.

The Chiericati Palace at Vicenza is well represented and accurately drawn. The angle columns—according to Vitruvius's rule, which must have been derived from Greek practice—are drawn slightly larger in diameter than the intermediate columns. The somewhat unusual feature of impenetrating columns, which strengthen the angles of the front projection, has a Classical prototype—viz., at Brescia, and also in the lately-discovered basilica at Lincoln and in some Romano-Greek examples in Asia Minor. The proportions of the Chiericati Palace are very refined, and I remember finding that in drawing it, it demanded as much exactitude as a Greek temple to convey any adequate idea of its character. There is in the same portfolio a rather rough elevation of the Valmerana Palace at Vicenza. Here I will make a short digression from my main subject to observe that the beauty of this design is little understood from a mere elevation, because all the strength seems given to the centre, and nothing but weakness to the angles. Fergusson, in his "History of Modern Archttecture," criticises this design severely: "The angles, instead of being strengthened either by being brought forward or rusticated, are weakened by having two more stories of windows inserted, and instead of repeating one of the pilasters which encumber the centre, we have only a detached statue to support the general cornice, thus adding absurdity to weakness. We find, in short, in this design ornament utterly divorced from construction." I am inclined fully to believe that any architect who knows this building only on paper, in the published designs, or indeed in this very portfolio, must agree more or less with Fergusson; but it is a different thing when the palace itself is seen at Vicenza. The street in which the palace is built forms an internal angle at each end of the front, and the houses built on each side of the front butt solidly against these extremities, giving to each of the statues the effect of being placed in a kind of niche, so that they have a very different meaning in reality from what they seem to have when the design is looked at as of a detached building.

In one of the cases there are a few drawings by Vignola, which are well worth your attention. They are both highly artistic and practical. All is good explanatory drawing, and without any tricks of effect. Palladio's drawings have the same practical merits, but a higher artistic quality. If the executed buildings of the two are compared, Vignola will be found quite to hold his own. Many years ago I saw at Bologna an

interesting collection of drawings by several noted Italian architects of the sixteenth century (about 1560), being competition drawings for a west front for San Petronio. Among the designs were two by Palladio and one by Vignola. I find by a note made at that time that I thought the draughtsmanship of Vignola much the more artistic of the two great rivals.

In the same case with the Vignola drawings are some by Inigo Jones. These are for the most part more sketchy than the drawings by the two great Italians above spoken of, but a few are excellent specimens of draughtsmanship. I particularly refer to a finished drawing of Inigo Jones's famous water-gate. It is outlined in pen-and-ink, and slightly shaded by hatched work. This drawing is well worth the attention of those who prefer that style of treatment; but the Italian architects chiefly relied on a rather slight shading in monotint, which I must consider less likely to confuse the form of the outline than pen-and-ink hatching. Some exceedingly valuable criticism on the imperfections too often attending this manner of drawing was given in the Review of the Students' Work in January, 1893. There are several highly-finished drawings by Kent well worth examining. They are most carefully drawn and shaded—rather too deeply I think—in monochrome.

I have now the pleasure of referring to the magnificent collection of drawings illustrative of the Pantheon at Rome, by M. Chedanne, which has been so graciously lent to us for this occasion by the French Government, and of which we are looking forward to a description this evening by M. Chedanne himself, to whom we are most glad to offer hands of fellowship, and are not unmindful of the sacrifice of personal comfort he has made for us in coming over at this season of the year. Mr. Spiers last Monday gave us some outlines of M. Chedanne's work and discoveries, and has made us very desirous to hear further particulars from himself. Into the very interesting historical and archæological points illustrated in these drawings I do not propose to enter: it would be foreign to the purpose of my address to-night. What I do wish to call to your attention is the wonderful elaboration and refinement of finish in these drawings, and the pains which must have been taken to ascertain and accurately, as well as artistically, delineate so much valuable detail as he has collected. I feel sure that these drawings will hold a high place amongst the collections of the Grand Prix works of the French Academy: but it is important for us to remember that almost every year works worthy of being collocated with these are produced in France. Our best draughtsmen will be the first to recognise that we in England have nothing comparable to them. It is perfectly true that our architectural education does not lead us to aspire to draughtsmanship of such perfection, and there is nothing in this country parallel to the encouragement given to it by the French Academy in the Grand Prix Studentships. It is, moreover, in France the growth of many years of emulation; and I well remember the perfection of the French architectural drawings fifty years ago. And although I do not think that, considering our methods of education and our requirements, we should be justified in urging our students to attempt rivalry with such works as we see here to-night, it is well worth the attention of those who wish to improve their draughtsmanship beyond the utilitarian limit to examine well M. Chedanne's drawings for the sake of their stimulating effect. The drawings which it seems to me will be of the greatest benefit to our students are the fine outline drawings, such as Nos. 21, 23, and 30. But from the exquisitely shaded works, such as Nos. 4, 6, 9, 10, and 11, there must be many valuable hints to be obtained. The very creditable drawings in outline by some of our students this year assures me that they, at least, will not examine M. Chedanne's drawings without profit. Extraordinary indeed is the difference between Palladio's simple handwork and these finished drawings. A sound, practical *viâ media* between the two seems not to be unattainable by us, which, if we can reach—as I hope we may—the kind courtesy of our French contemporaries will not have been lost upon us.

Mr. R. Phené Spiers then read a short description, based on M. Chedanne's Report submitted to the Academy of France, in regard to some important points discovered by him in his examination of the Pantheon. Before commencing the work of restoration he had noted that the axes of the small altars, which formed the chief elements of the interior decoration, and those of the circular niches or apses, formed in the thickness of the wall, were in the same line. This fact gave proof that the builder of the edifice was also its decorator. His researches commenced at the springing of the vault above one of the four rectangular chapels. On the removal of the stucco decoration of three coffers of the lower range, three small arches were exposed, whose springing was vertically over the columns of the ground floor, whilst that of the greater arch, which enclosed them, rested on the piers on each side. The surface of the bricks proved that these small arches had been built in, to accord with the design of the coffer, and not cut afterwards, as might have been supposed. A hole which he was enabled to cut at a higher level opposite the top of the greater arch showed this arch to be vertical. This at once disproved the hypothesis of Piranesi, that this greater arch formed part of a series which constituted the outer skin of the cupola. Further examination also disproved the assumption that the dome of the Pantheon was constructed in light porous stone and pottery, and would not be able to carry the bronze flower bosses in the centre of the coffers and on the ribs, as he found bronze cramps built into the solid vault to carry these features. The whole vault was, in fact, built in solid brick, and supported at its springing by the great vertical arches already referred to, which were carried through the thickness of the wall, rising outside to the top of the circular wall of the building. The whole thickness of the vault was built in brick laid in horizontal beds, at all events, up to the level of the third range of coffers, as ascertained by M. Chedanne; the same horizontal bedding of the bricks also being found in the proximity of the central opening in the vault. This threw altogether a new light on the construction, and although it bore out the theory put forward by Professor Middleton, that the whole vault was solid and exerted no thrust, this was due to a totally different cause—viz., the horizontal bedding of the bricks of the vault, and not to the cohesive properties of the concrete mass of which it was supposed to be composed. The reference made to the springing of the small arches in the vault and their position exactly over the columns of the ground-story emphasised M. Chedanne's argument that the decoration formed part of the original and main construction, and that the columns in question, which had been assumed by most writers to be decorative features and added at a later period, form part of the integral construction of the rotunda. The numerous relieving arches which M. Chedanne showed in drawings Nos. 15, 16, and 24, were all necessary constructive features in his estimation, and the cutting through of some of them by Dori in 1747 led to cracks in the superstructure. The removal of some of the bricks from the main vault was facilitated by the cracks already existing there, and he noted they were stamped with dies known to be of the time of Hadrian, and of the probable date of 123 A.D. Mr. Spiers then went on to recapitulate the reasons, some of which have been already referred to in our columns, for M. Chedanne's conclusion that the portico had been rebuilt at the same time with the erection of the rotunda. The modillions of the cornice of the pediment were not equally spaced out—the decorated mouldings under them were cut irregularly by the existing joints—the bases and capitals of the pilasters inside the portico intersected in a clumsy way, not always being on the same level; and the right-hand return of the portico was not quite at right-angles with the principal front. Besides these minor details, the proportions themselves of the pediment afforded an unmistakable evidence that the existing portico was built of features taken from an earlier edifice. The height of the pediment was a little more than a quarter of the width of the front—a proportion satisfactory in a tetrastyle portico like that at Pola, but quite inadmissible, according to Vitruvian rules, in an octastyle portico. M. Chedanne considered that the original portico was decastyle. He was led to this hypothesis by the discovery that the modillions in the raking cornice of the portico were not quite vertical; *i.e.*, the stones had originally been cut for a cornice of a different rake from that of the pediment as it now stands. The inclination of the modillions was exactly that which would have occurred if a portion of a cornice of a decastyle portico had been utilised for the present octastyle one. At the apex of the portico it was necessary that a new block of stone should be cut to fit the older portions of cornice used up with a raised pitch, and here M. Chedanne found that Hadrian's builder showed his weakness. He did not even take the trouble to space out equally the modillions on each side, and the ornamental mouldings he carved under them were of the poorest kind. Following out the line of reasoning thus started, M. Chedanne pursued his investigations under the pavement, and succeeded in finding the original foundation-wall, in travertine stone, of the extra column required to complete the original decastyle front.

The President then moved a vote of thanks to the French Government for the loan of the drawings and to M. Chedanne for coming over to this country at an inclement season, to give them the benefit of his learned researches. He considered it a great credit to the Institute and a great advantage to the architects of this country, and especially to those who belonged to the Institute to have these remarkable works put before them. In one of the rooms below there was a series of admirable drawings which by the courtesy of the French Government they had been able to exhibit in London, and which must be of very great importance to all students. It enabled them to see what could be done in the way of architectural delineation.

Mr. E. W. Mountford (President of the Architectural Association) said he was proud to have the honour of seconding the vote of thanks to the French Government and to M. Chedanne. He could assure M. Chedanne that they all admired the great patience evinced in his beautiful drawings, and they must all admit the great artistic merit shown in them. He was afraid it would be a long time before France would pass a similar vote of thanks to our Government. Their thanks were also due to Mr. Brydon, who had suggested the idea of obtaining the loan of the drawings from the French Government.

The motion was carried with acclamation, and the President, addressing M. Chedanne in French, said, "Je m'empresse de vous informer que les Architectes Britanniques ont voté à l'unanimité leur remerciments les plus cordiaux et respectueux au Gouvernement Français pour le prêt des dessins du Panthéon à Rome, dont vous êtes le bien habile et le très savant auteur."

M. Chedanne very briefly replied. He said: "Monsieur le Président, mesdames, et messieurs, je dois vous prier de m'excuser si je vous adresse en Français, ce que je fais avec d'autant moins de crainte que vous parlez ici ma langue aussi bien que moi. Je vous remercie du fond de mon cœur pour l'honneur que vous avez voulu faire à mon pays. Je n'ai pas le droit de m'arroger toutes les louanges qui ont été accordées, et je ne les accepte que pour la France et pour mes camarades. J'ai eu la chance de me trouver ici avec mes pauvres dessins, mais le gouvernement aurait pu envoyer des dessins d'autres artistes plus méritants encore. De la part de mes camarades, de nôtre école d'artistes et de la France, je donne à vous, Messieurs, les architectes Britanniques, et à l'Institut Royal mes remerciments les plus chaleureux."

Mr. J. M. Brydon then delivered an address, in which the usual review of the year's work of the students in competition for prizes and studentships was presented.

Mr. W. Emerson proposed a vote of thanks to Mr. Brydon for his interesting address, which was seconded by Professor Aitchison. The motion on being put was carried unanimously, and Mr. Brydon having briefly replied, the President distributed the prizes to the successful competitors. We published a full list of the prize-winners last week, page 27.

The President announced that the next meeting of the Institute would be held on the 28th inst., when Mr. J. A. Strahan, M.A., Barrister-at-Law, would read a paper on "The Legal Position of Architects in relation to Certificates and Awards." The meeting then terminated.

SMELLS IN CLEAN SEWERS.—We take the following from the annual report of the Borough Surveyor of Stockport, which has been forwarded to us:—"One peculiarity has been noticed when making investigations as to the cause of evil-smelling gases reported to exist in certain new sewers in the Edgeley district. These sewers have flushing-tanks in constant operation, and on being inspected at the time the complaints were made were found to be perfectly clean and free from deposit. From this circumstance it may be concluded that even in new clean sewers foul odours are generated. The sewers in question only receive ordinary domestic sewage, rainwater, &c.; probably not more than a dozen water-closets are connected to them, and no chemicals or other manufacturing refuse flow in."

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Christmas recess was held on Tuesday, at the County Hall, Spring Gardens, Sir John Hutton, Chairman, presiding.

Painting of Hammersmith Bridge.—The report of the Bridges Committee contained the following paragraph :—

"In June, 1893, the Council decided to have the towers, the chains, the longitudinal girders, and the upper portions of Hammersmith Bridge painted, at an estimated cost of £1,000, leaving the inside of the towers and the under parts of the bridge to be painted in the following year. The Council at the same time directed the Works Committee to carry out the work, and for that purpose referred the specification and estimate to the Committee. The Works Committee in November following reported that it had considered the estimate and specification, and that it was satisfied with them. The engineer has informed us that the final account of the cost of the work has been sent to him for certification, and that considerable difference exists between his staff and the Works Department on the subject. To the original estimate a sum of £330 5s. 1d. has to be added for certain extra work executed, particularly painting below the platform not originally contemplated when the work was undertaken. This the engineer has allowed for at the full rates of the other part of the work which include scaffolding and the use of tools and plant. As, however, there was some extra expense on account of watching and boatmen's hire, the engineer has allowed, in addition, the sum of £175, which the Works Department states was the cost of the same. According to the accounts made up by the engineer on the prices originally agreed to, the cost should work out as follows—

	£	s.	d.
Contract amount	1,000	0	0
Extras (painting)	330	5	1
Do. (watching, boatman's hire, &c.).....	175	0	0
	1,505	5	1

The Works Department claims to have spent—

	£	s.	d.
For labour.....	1,476	11	11
,, materials, including cartage	411	2	2
,, use and waste of plant ...	116	5	7
,, establishment charges	182	12	2
	2,186	11	10

and thus it will be seen that there is a difference of 681*l.* 6s. 9d. One of the items in the estimate was 1,747 sq. ft. of gilding, at 3s. per sq. ft., total 262*l.* 1s. In the final account sent in by the Works Department there is a charge for gilding amounting to 586*l.* 0s. 6d., and as the quantity was unaltered, this gives an average price of nearly 7s. per sq. ft. The engineer states that, however much quantities may differ in the execution of a work, it is not usual to permit contractors to enhance their prices should the work prove unremunerative at the contract rates. With regard to the cost for labour, this comes to 1,476*l.*, whereas the original estimate for the total work, including labour and materials, was 1,000*l.* When the subject was further gone into, there was only one item of measurement that was in the slightest degree ambiguous, namely, that of the 1,747 sq. ft. of gilding at 3s. per square foot. This part of the work is noted in the specification, and described as follows—'The portions to be picked out with gold shall be all those parts of the structure at present gilded.' It is not disputed that the quantity of 1,747 sq. ft. has been exceeded, but what is disputed is, that owing to its being in narrow strips and scroll-work it ought to be charged at a higher price than was specified. The best way of settling the difference appeared to be to refer it to Messrs. Thacker & Sons, one of the three firms of quantity surveyors appointed by the Council to take out the quantities of the Council's works. This course was accordingly taken, with the result that Messrs. Thacker & Sons state that, having looked into the question of the gilding, and acting on the wording of the specification and bill of quantities, they must decide that only the price stated therein can be paid for the work done. It is clear that the Works Department was aware, before the commencement of the work, what was the character of the gilding to be executed, as it was the same as was on the structure. The engineer has, as far as possible, dealt liberally in the matter of the painting of the bridge, and has allowed over 50 per cent. for extras above the sum at which the Works Department undertook to execute the work. Owing, however, to the work having been carried out during the winter months, the sum paid for labour alone exceeds 1,476*l.*, which no re-arrangement of the quantities can possibly adjust. We are of opinion that no fault is attributable to anyone. The instance is only one of those which must inevitably occur from time to time with the Works Department as with any outside contractor; that is to say, some works will, and some will not, be completed within the amount originally estimated. We recommend—

'That, subject to a supplementary estimate being submitted to the Council by the Finance Committee as required by the statute, the extra cost of 1,186*l.* 11s. 10d. incurred in the painting of Hammersmith-bridge be sanctioned.'"

Mr. Ward, the chairman of the Works Committee, said in painting works the estimate was often exceeded. For instance, seven tenders from contractors were received for painting the bridges of the Northern Outfall, the lowest being 270*l.*, while the highest was 1,425*l.* Again, the highest tender for painting Abbey Mills pumping station was 1,597*l.*, while the lowest was 398*l.* The chief reason for the increase in the case of Hammersmith Bridge was the fact that the work had to be done in the winter. A large portion of the work had to be painted six times instead of four, owing to the weather, and much of the gilding had to be gone over a second time. It was, moreover, one of the first jobs undertaken by the Works Committee, and was subject to establishment charges that amounted to 9½ per cent.

Mr. Beachcroft said he thought that the winter was a most unsuitable time to carry out such work.

Mr. Sidney Webb pointed out that in the programme issued in view of the forthcoming election by the Metropolitan Union of Conservative Associations, it was distinctly stated that the Moderate candidates considered that "public work undertaken by the County Council should be performed, as far as practicable, in those months when work in other directions is less abundant."

Sir John Lubbock, M.P., said that the Moderate party were all in favour of paying fair wages, but the original estimate had been based on the condition that fair wages should be paid. There was, of course, a desire to start works at times when many men were out of employment, but was it wise to do painting works in inclement weather? He had never made an attack upon the Works Committee. No one recognised more than he did the honesty and ability of its members, and the conscientious endeavours they had made to carry out the important duties entrusted to them. But his contention always had been that they could not expect work of that kind to be done by an amateur Committee, and the more the Council went on with the experiment the greater would be the loss to the ratepayers.

Mr. Charles Harrison (vice-Chairman), pointed out that the Commissioners of Sewers made their own harness and several other things, and that municipal work was carried out by other corporations, and nothing was said in those cases about "amateur Committees" or about money being wasted.

Mr. Burns, M.P., said that the Committee had done the work in the winter in obedience to a resolution of the Council directing that, as far as practicable, work should be provided at such a time, it being recognised as the most scientific way of grappling with the unemployed problem, to pay men wages for work done rather than incur a larger expenditure in outdoor relief and private charity. A contractor might, of course, have made the job pay at the original estimate, but he could only have done so by putting on "sheepskin" instead of paint, and using varnish at seven instead of twelve shillings the gallon, if, indeed, he did not omit the varnish altogether. Were not all the committees "amateur"? On the Works Committee there were experienced experts like Mr. Ward, Mr. Lyon, Mr. Taylor, and Mr. Goodman; and what had the successful Finance Committee been but a body of enthusiastic amateurs who had the advantage of the expert opinion of Sir John Lubbock, Mr. Hoare, and Mr. Cohen? Beaten gold cost more than Dutch metal, and the Council, moreover, had used the best English white lead, which cost from 30 to 40 per cent. more than the stuff a contractor would have used. Again, the Council had had thoroughly efficient supervision, which cost money, instead of employing a bricklayer as clerk of the works. Much of the increased cost was due to the bridge having been painted underneath, which was not contemplated in the original estimate.

After some further debate, the recommendation of the committee was adopted.

Proposed New Approach to Richmond Park.—The Improvements Committee, reporting on a letter from her Majesty's Office of Works, again asking the Council to undertake the formation of a new approach to Richmond Park by the conversion of Priory-lane, Roehampton, into a public road, stated that the Council last May decided not to undertake the suggested improvement, as it was very doubtful whether the opening up of the lane for vehicular traffic would benefit any large portion of London, and the Council hesitated to incur an expenditure of some 11,000*l.* or 12,000*l.* in forming an approach to a park which was not under the control of the Council. The First Commissioner of Works offered to make arrangements for opening the Roehampton-gate to the park subject to Priory-lane being made a public way, and expressed the opinion that the Council's estimate of 11,000*l.* or 12,000*l.* was unnecessarily high, and that the estimate of the Wandsworth District Board (5,000*l.*) was sufficient. He further suggested that the advantage to London generally of opening a direct road to Richmond Park would justify the Council in incurring an expenditure of at least 5,000*l.* After having given full consideration to the subject, the committee said they could not recommend the Council to carry out the suggested improvement at present, and they asked the Council to agree to a recommendation to that effect.

This was agreed to.

Sea-water for London.—Lieut.-Colonel Ford moved the following motion standing in his name on the agenda paper :—

"That it be referred to the General Purposes Committee to consider and report on the feasibility and desirableness of securing a supply of sea-water for London, with a view to its use for sanitary purposes."

Mr. Torr seconded the motion.

Mr. Burns said that, considering the Water Committee had the matter in hand, he thought it was no use referring it to the General Purposes Committee. To do the thing properly they would require 30, 40, or even 50 millions of gallons of sea-water a-day, and they could not afford to do that.

The motion was lost.

District Surveyors and Buildings Erected in Contravention of By-Laws.—Mr. Hubbard (in the absence of Mr. Weir, M.P.) moved :—

"That, in the case of houses and buildings constructed in contravention of the by-laws of the Council and passed by a district surveyor, the Building Act Committee be instructed to report to the Council the name of the district surveyor who has passed such work, or allowed the use of improper materials, and also the name of the builder who has executed such work, or made use of such improper materials."

Mr. Taylor seconded the motion, which the Chairman of the Committee agreed to accept as a reference for consideration.

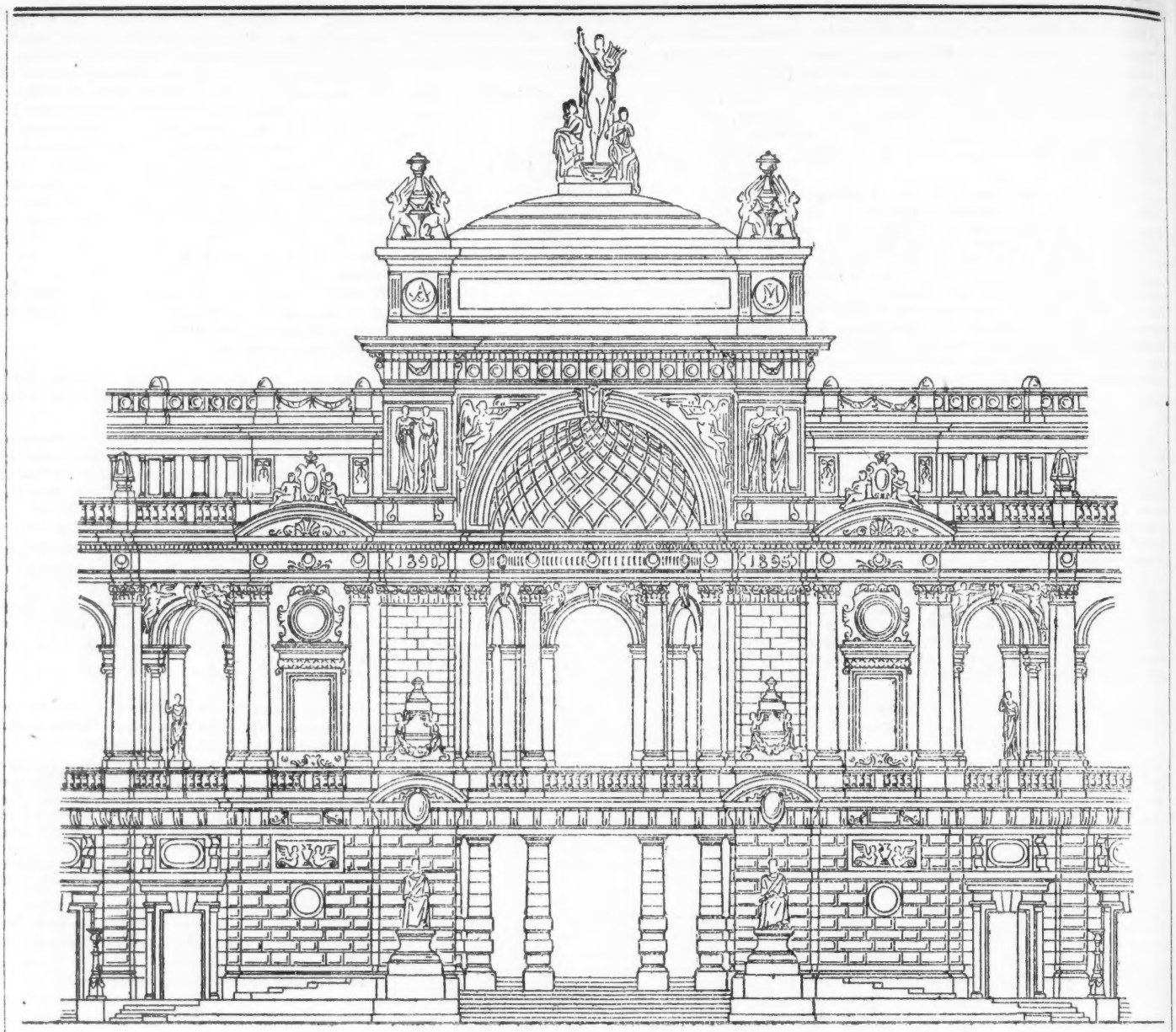
The Council soon after adjourned.

COMPETITIONS.

SCHOOLS, MOSS SIDE, LANCASHIRE. — A special meeting of the Moss Side School Board was held on the 9th inst. at the St. James's Schools, Barton-street, Moss Side, for the purpose of selecting the plans and designs for the proposed new schools to be erected by the Board in Upper Lloyd-street. Five architects had been invited by the Board to send in competitive designs, and these were now submitted for consideration. The Clerk (Mr. W. E. Rowcliffe) read the remarks of the assessor upon each set of plans. After some discussion Mr. Nasmith moved, and the Rev. W. Challenor seconded, "That the plans marked No. 6 be accepted subject to the small scheme not costing more than 6,200*l.*" Mr. Birdsall moved as an amendment "That the plans marked No. 1 be accepted." Dr. Fraser seconded this amendment, which, on being put to the meeting, was rejected. The original motion was then carried. The following are the names of the competitors :—No. 1, Messrs. Potts, Sons, & Pickup; No. 2, Messrs. Royle & Bennett; No. 3, Messrs. J. R. Beaumont & Co.; No. 4, Messrs. Pennington & Son; No. 5, Messrs. Potts, Sons, & Pickup; No. 6, Messrs. Woodhouse & Willoughby.

SCHOOLS, WHITLAND, SOUTH WALES.—We are informed that out of twelve sets of designs sent in for an intermediate school at Whitland, South Wales, those of Messrs. Griffiths & Jones, architects, of Pontypridd and Tonypandy, have been selected, and they have been instructed to obtain tenders for the carrying out of the work.

PROGRESS IN ELECTRIC LIGHTING. — The *Electrician* for January 18 publishes a useful map of a portion of London, showing, by means of distinguishing colours, the mains already laid down by the various electrical supply companies for domestic use, exclusive of public lighting. The map shows the areas allotted to the various metropolitan companies and local authorities, the thoroughfares through which the mains are laid, the position of the supply stations, &c.



New Opera House, St. Petersburg: Central Feature of Front Elevation.

Illustrations.

THE MONUMENT TO GOETHE, BERLIN.

THIS monument, by Professor Schafer, one of the most eminent German sculptors of the day, is situated at the outer edge of the "Thiergarten" at Berlin, only about a hundred yards distant from the Lessing monument, which was illustrated in our pages some little time since.

The monument, entirely of white marble, consists of a well-designed architectural pedestal adorned with three groups of sculpture symbolising respectively Dramatic and Lyric Poetry, and Scientific Research. Of the two former groups we give separate illustrations; we could not easily find place for the third without reducing them to too small a scale. The monument is surmounted by a portrait figure of the poet about 10 ft. in height. The figure is dignified in pose, and the monument has the merit also of grouping well as a whole.

The illustrations are from photographs by Herr Rueckwardt, of Berlin.

THE NEW OPERA HOUSE FOR ST. PETERSBURG.

WE give this week the longitudinal section from front to back of this immense projected opera-house, which is perhaps of more interest than the exterior elevation. A plan of the main floor is subjoined, together with portions of the front and rear elevations to a larger scale than that of the general elevation.

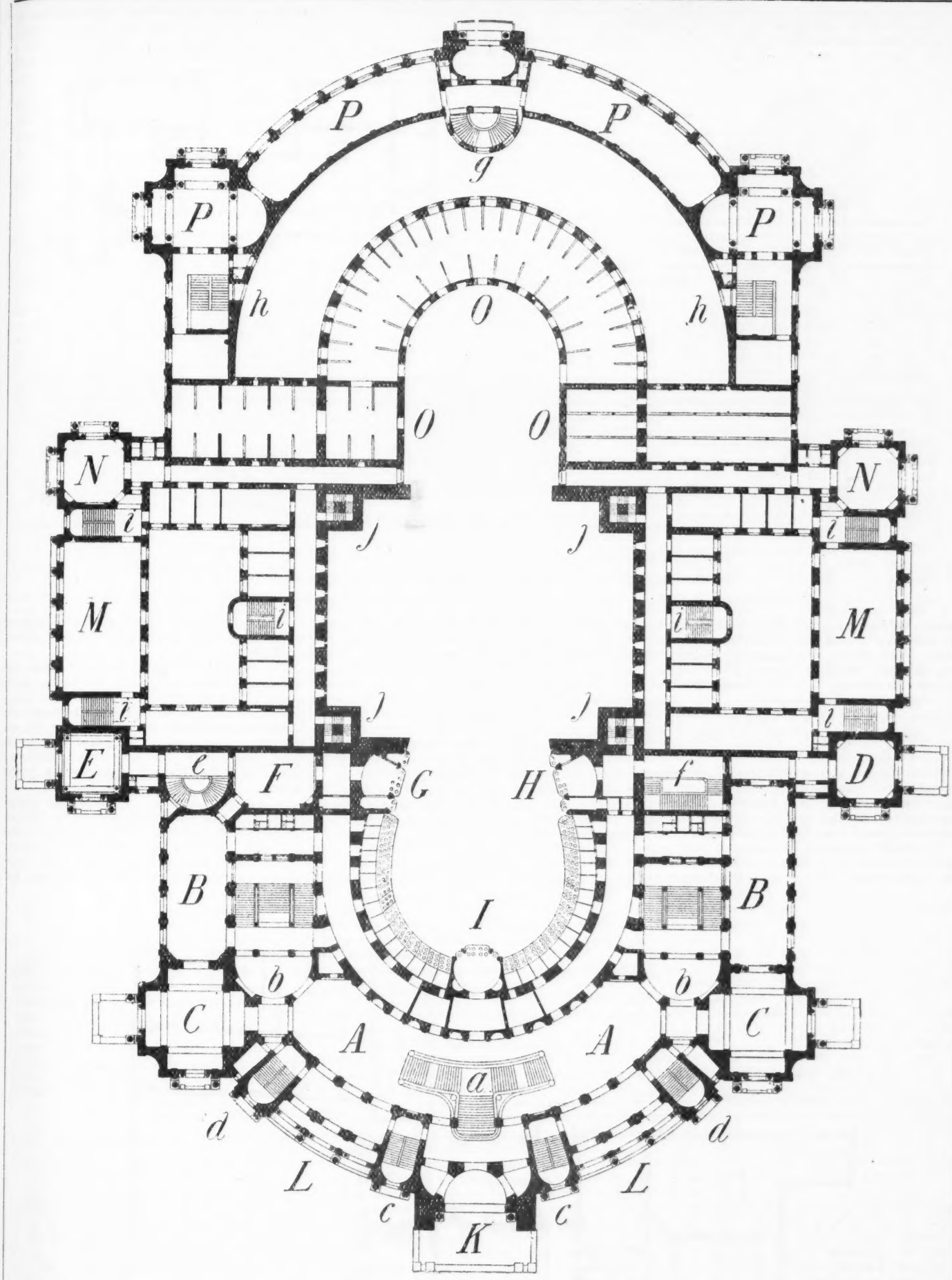
In our last number the entrances and the distribution of the staircases were described. As will be seen from the subjoined plan of the main floor the *foyer* accommodation predominates on this level to the same remarkable extent as the lobbies and vestibules on the floor below. The great central *foyer* (curved in plan), however, serves more as a large hall than a *foyer* proper. Two side *foyers* fulfil the requirements of promenades, and there are two refreshment-rooms and a smoking-room in connexion with these. The curved central hall which would make such an admirable promenade, as in the case of the Dresden and Odessa Opera Houses, is unfortunately broken up by the grand staircase, which is intended for the State visits of the Czar. Both the late Czar and the author of the design, Professor Schroeter, recognised the disadvantages of the central stairs, and it is not unlikely this feature will eventually be cancelled. According to some notes on the original plans, from which the illustration has been prepared, the late Czar proposed having one of the minor grand staircases so arranged that it could be easily reserved for his State visits. This would allow of a very imposing spectacle when the Imperial procession moves from the end of the curved hall to the grand royal box in the centre. This box, as will be seen from the plan, has a small-ante-room, but it is intended to use the central hall for the Czar's receptions and "court." Just opposite to the entrance of the royal box is a spacious segmental loggia, from which the Czar can acknowledge any public demonstrations outside. Side loggias then afford accommodation for spectators.

As will be seen from the plan, the Czar's private box on the first tier has its own spacious ante-room and reception-room, and the private staircase shows ample dimensions. There is a pass-door between the ante-room and one of the large side *foyers* for exceptional circumstances. Just below the Royal box is the so-called *incognito* box, which is generally put at the disposal of the younger members of the Imperial Household. This box has its own reception-room, and there is the usual pass-door to the stage. On the opposite side of the auditorium boxes are reserved for the Lord Chamberlain and the Theatre Administration, and these have their own entrance, staircase, and reception-rooms, but on a smaller scale than in the Czar's suite. A special "Authors' Box" is also provided on this side.

Referring to the large library and museum, which takes up the back of the building, it will be seen that the halls are curvilinear in plan, and are approached by two staircases. The grand stands for watching the military spectacles on the Champs de Mars, referred to last week, are arranged below the windows of the museum and library, so that the view from the windows is not blocked. A loggia for the Czarina takes up a central position on the same level of the windows, which together form what one could term the "boxes" above the stalls of the grand stand. The Czarina's loggia has a separate staircase.

As regards the architectural treatment, this can be judged of pretty fairly by our exterior elevation of last week and the portions of the front and rear elevations given in connexion with this article. The façades will be entirely of sandstone picked out with bronze. The architectural treatment of the interior, which is indicated in the section, shows the same avoidance of over-decoration as the exterior. The late Czar specially wished to have "Classical" surroundings.

Professor Victor Schroeter, the Czar's private architect and Architect-in-Chief to the Imperial Theatres Department, is responsible for the design, which, however, was most studiously supervised by the late Alexander III. Professor Schroeter,

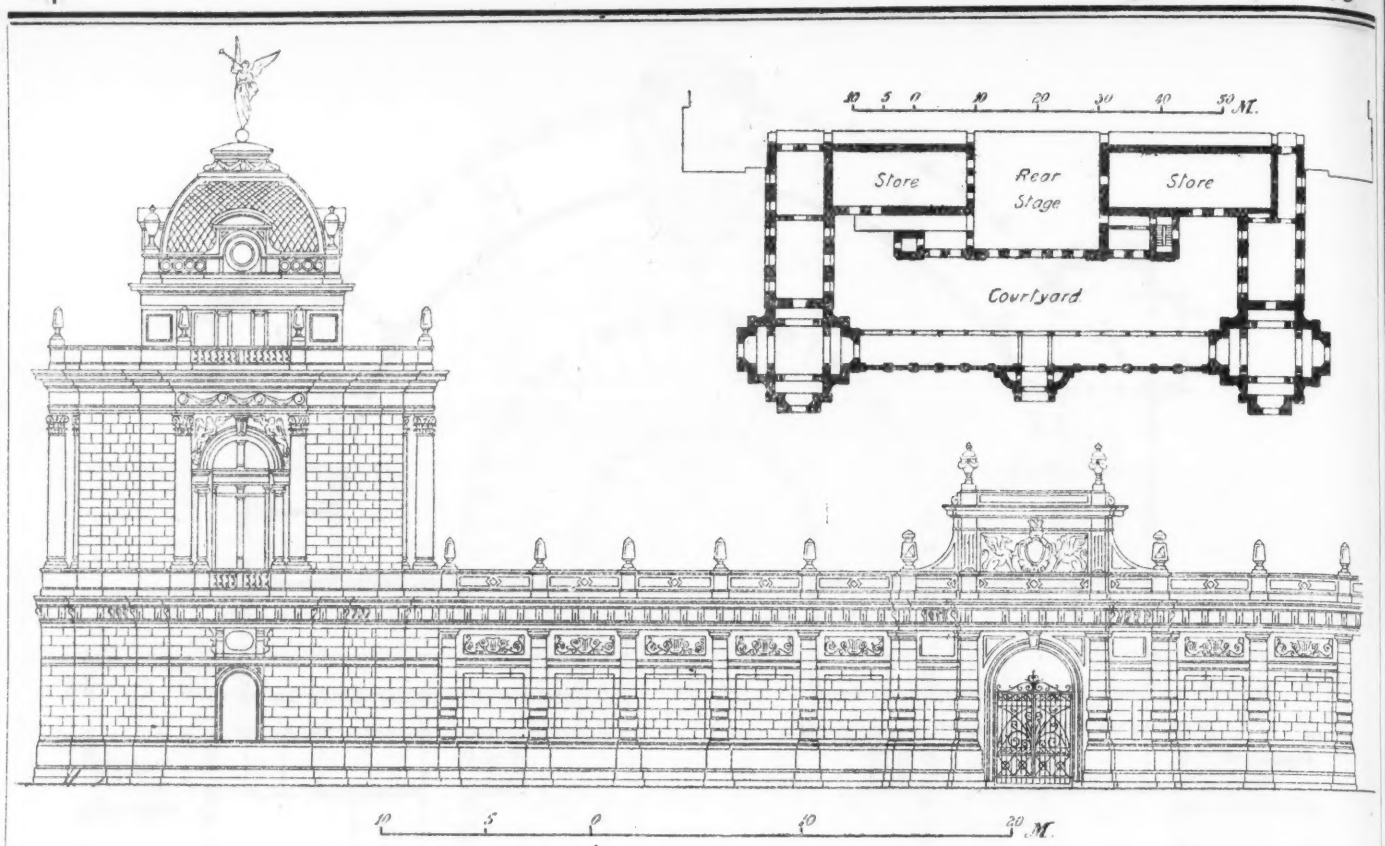


Plan of New Opera House for St. Petersburg.

FIRST TIER LEVEL.

A Grand Central Foyer.
B Side Foyers.
C Refreshment Rooms.
D Smoking Room.
E The Czar's Reception Room.
F The Czar's Ante-Room.
G The Czar's Private Box.
H The Lord Chamberlain's Box.
I The Czar's State Box.
K Central Loggia.
L Side Loggias.
M Rehearsal Rooms.
N Green Rooms.
O Scene Stores.
P Dramatic Library.

a Grand Central Staircase.
b Minor Grand Staircases.
c Staircases to Third Tier.
d Staircases to Fourth Tier.
e The Czar's Private Staircase.
f The Lord Chamberlain's Private Staircase.
g Staircase to Grand Stand Loggia.
h Staircases to Dramatic Library.
i Dressing-room Staircases.
j Stage Carpenters' Staircases.



New Opera House, St. Petersburg: Part of Provisional Rear Elevation.

besides holding the responsible Court offices, has an extensive private practice in theatre-construction. Some of the latest examples of his work are at Tiflis, Rybinsk, Nishni-Novgorod, and Irkutsk, in Siberia. EDWIN O. SACHS.

SOUTH-EASTERN AGRICULTURAL COLLEGE, WYE, NEAR ASHFORD, KENT.

THIS building is a much-altered 15th century foundation of monastic origin, having been built prior to 1446 by the great Cardinal Archbishop and Lord Chancellor of England, John Kempe, who had himself been born in the parish.

The Cardinal's foundation carried on its religious and educational work in the quiet enjoyment of its emoluments up to 1534, when the then provost subscribed to the act of succession and king's supremacy, and the subsequent and last provost surrendered all its possessions to the king.

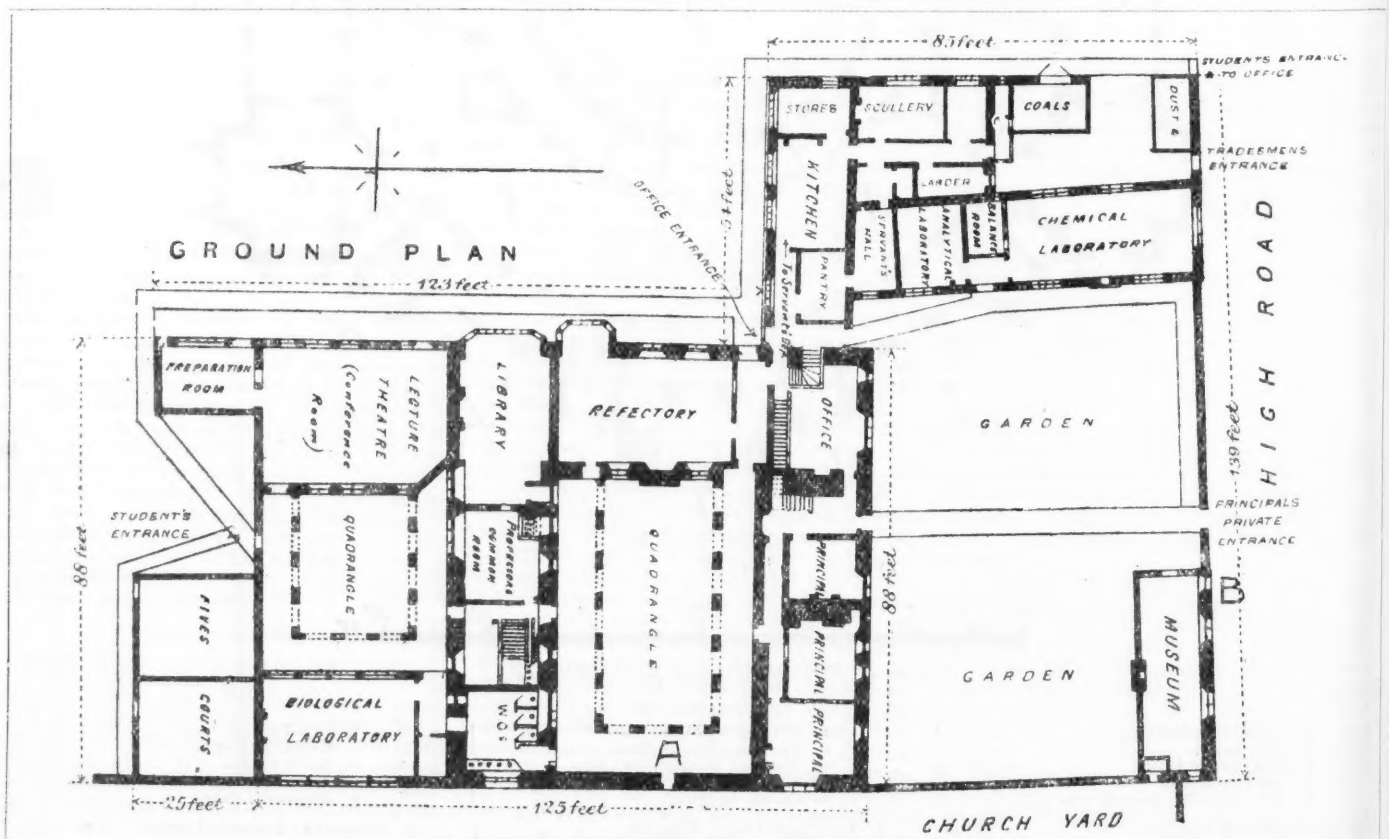
Henry VIII., with the generosity born of easy acquisition, gave it away, "with all its endowments, jewels, and ornaments," to "Walter Bucher, Esq.," Queen Katharine's secretary, from whom it passed successively through various private hands, until towards the end of the seventeenth century it became the property of the Rev. Sir George Wheler, Prebendary of Durham.

At his death, in 1724, he divided the buildings by will into two halves, leaving one for a grammar-school and the other to Lady Joanna Thornhill's Charity School.

Within the last few years it has been made over by the Charity Commissioners for the purpose of giving agricultural education under the County Councils of Kent and Surrey, who have also leased an adjoining farm for the practical part of their teaching.

The original college of Kempe's times had lower walls of stone and a half-timber upper story. The timber work appears to have failed, for in the middle of the eighteenth century it was bodily removed (with the exception of the oak kingpost principals), and brick outer walls were built over the undisturbed stonework below, and the internal arrangements greatly altered.

In order to adapt the building to its present purposes, a new quadrangle has been added on the north side, which provides a biological laboratory, with bedrooms over, and a lecture theatre. The infants' schools—a modern excrescence—have been converted into chemical laboratories, and



South-Eastern Agricultural College, Wye.—Ground Plan.

A—Ancient Priests Door. B—Part of Old Chapel.

an administration block added at the south-west corner of the old building.

The fine carved oak work has been rescued from its whitewashed condition, and an oriel and bay window added to the refectory and library.

The building contractors have been Messrs. G. E. Wallis & Son, of Maidstone, and the architect, Mr. Paul B. Chambers, of Brighton. The drawing was exhibited last year at the Royal Academy.

STABLING AND ENTRANCE-LODGE, BISHAM-ON-THAMES.

THIS illustration represents the side and back of a group of buildings comprising stables, coach-houses, grooms' rooms, coachman's house, and the gate-keeper's lodge to a country house at Bisham-on-Thames. The base of the buildings is faced with red bricks, the walls immediately above being rough-cast; the upper portions are constructed in half-timber-work, and with brick-work hung with weather-tiling. The roofs are covered with plain tiles, and the stable-turret with copper. Messrs. Kidner & Berry are the architects. The drawing was exhibited in the Royal Academy last year, but does not represent the principal front of the buildings.

SKETCHES BY THE "PUGIN STUDENT" OF 1894.

THE admirable set of sketches which represent the work done on his studentship tour by Mr. R. Shekleton Balfour, who gained the Pugin Studentship in 1894, have been already referred to in terms of praise in our columns. The sketches which we publish this week are selected from those which Mr. Balfour submitted when competing for the studentship last year. Mr. Balfour sends us the following notes in regard to them:—

"*St. John's College, Cambridge.*—The view shows an angle of the second court, built 1595-1620. It is fortunate that restoration has been unnecessary to any extent, and consequently it presents a fine piece of colour. The large traceried windows light the hall, and the tower staircase, with the portcullis over the doorway, leads to the combination-room.

Aldwincle All Saints, in the Nene valley, at the rectory of which John Dryden was born, bears a strong resemblance to its not very distant neighbour Whiston, especially in its sturdy and withal graceful tower and numerous gargoyles. The nave arcade and part of the chancel are Early English, the remainder of the church being chiefly Perpendicular. The chantry seen in the sketch was built in 1489 by "Wm. Chamber and his wife." The church, but recently well restored, has a couple of good brasses.

The tower and spire of *St. Mary's, Stamford*, form a conspicuous landmark in this quaint old town of two counties, standing at the head of the main street leading up from the bridge over the Welland. The tower (Early English) and spire (Decorated) are singularly rich in ornament and detail, while the church proper, principally Perpendicular, has been recently fitted with a rood-screen and other furnishings by the late J. D. Sedding. In the chancel is the tomb of Sir David Phillips, with exquisite detail, much battered and worn, but kindly left unrestored."

THE ARCHITECTURAL ASSOCIATION:

THE TECHNICAL TRAINING OF WORKMEN IN THE LONDON BUILDING TRADES.

A CONFERENCE on the technical training of workmen in the London building trades, convened by the Architectural Association, was held in the Meeting-room of the Royal Institute of British Architects, 9, Conduit-street, on the 11th inst., Mr. E. W. Mountford presiding.

The following are some of the principal items which were printed on the agenda paper:—

To consider the advisability of becoming a permanent Committee.

To consider how the necessary administrative expenses of the Committee can be met.

To consider the desirability of preserving a record of the proceedings of the Committee.

To consider the relationship of the Committee to the Technical Education Board.

To consider the existing opportunities for a London boy to obtain a thorough training as a skilled artisan, viz.:—

(*a*) APPRENTICESHIP. Its gradual discontinuance and its possible restoration.

(*b*) TECHNICAL INSTRUCTION. Its proper direction, whether theoretical or practical; the character of the existing classes and their comparative utility; the local distribution of the classes with relation to the needs of the district; the character of the supervision of the existing classes; the restriction of the classes to men actually engaged in the various trades, and the question of assisting the various teaching bodies.

To consider the action of the London School Board as to manual instruction of boys and the desirability of developing this work.

To consider the work that the City Companies are now doing for the improvement of technical instruction for men in their respective trades, and the question of assisting in the development and extension of such work.

To consider the influence of the trade unions upon workmanship, and the conditions under which men become eligible for election to the unions.

To consider the influence of the South Kensington Building Construction Classes upon workmanship, and whether a more practical system of teaching might not be adopted with advantage.

To consider the system of Registration adopted by the plumbers, and the advisability of extending this system to other trades.

To consider the desirability of discussing the overlapping of trades, and consequent disputes and strikes.

To consider the possibility of organising competitions among skilled artisans in the building trades of the Metropolis upon somewhat similar lines to the recent Workmen's Exhibition at Islington.

To consider the advisability of organising meetings of workmen to discuss questions bearing upon the workmanship of the various trades, and to arrange for architects to be present at and take part in those discussions.

The following representatives were present:—Messrs. E. T. Hall, T. Cutler, and H. W. Burrows, for the Royal Institute of British Architects; Messrs. E. W. Mountford, W. H. Seth-Smith, F. T. W. Goldsmith, and Owen Fleming, for the Architectural Association; Messrs. M. E. Macartney and G. G. Frampton, A.R.A., for the Art Workers' Guild; Mr. T. G. Jackson, A.R.A., for the Independent London Architects; Mr. S. G. Bird, for the Institute of Builders; Mr. J. Verdon, for the Building Trades Federation; Mr. J. V. Eva, for the Operative Bricklayers' Society; Mr. R. Thurston, for the Amalgamated Society of Carpenters and Joiners; Mr. G. Cole, for the National Association of Operative Plasterers; Mr. C. Hill, for the United Operative Plumbers' Association; Mr. J. Thomson, for the Operative Stonemasons' Society; Mr. W. R. E. Coles, for the Plumbers' Company; Dr. Garrett, for the Technical Education Board; General Moberley, for the London School Board; Mr. A. L. Soper, for the City and Guilds Technical Institute; Mr. S. H. Wells, for the Battersea Polytechnic; and Mr. C. T. M. Millis, for the Borough-road Polytechnic.

The Chairman first proposed the name of Sir Arthur Blomfield as President of the Conference. He believed it would be agreed that Sir Arthur was a representative man, who would make an able President.

Mr. Goldsmith seconded the motion, which was unanimously agreed to.

On the motion of Mr. Hall, Mr. E. W. Mountford was next unanimously elected as vice-chairman.

Mr. Mountford, who occupied the chair, in the absence of Sir A. Blomfield, expressed satisfaction on the part of the Architectural Association at seeing so many of the invited representatives present that evening. The conference about to be opened originated in a paper, read before the Association some six months ago by Mr. Owen Fleming, upon the subject of the technical education of the workmen engaged in the London building trades. In the course of the discussion which followed, a resolution was agreed to that this conference should be held, and they had since then been endeavouring to get matters a little into shape. This was the earliest opportunity at which the conference could be held, and now that they had managed to meet he hoped some good would result. They had met in a perfectly friendly way, having nothing to do with any kind of politics or trade unionism. They looked upon the workmen as fellow-workers in the art of architecture and building, recognising that the interests of the architect and of the workmen should be identical. They also recognised that it was impossible to produce the kind of work the end of the nineteenth century should be producing, unless the architects and the workmen were at one in their determination to produce that good work. Some critics had said that the architects had better look at home and educate themselves before undertaking to educate others. Now that was just what the Architectural Association had been doing for the last fifty odd years. They had been devoting the whole of their time to educating architects, and though they did not profess to have made such education perfect, they had been doing their best in that direction. If they could not turn out better architects it was not their fault, but it seemed to them there was something also wanting to be done to improve the technical education of the workmen. They did not quite know what was required, and they therefore thought the best way to arrive at some conclusion on the subject would be to invite representatives from the various bodies concerned, to meet and talk the matter over in a friendly way. He hoped by that means they might arrive at some conclusion which might be of benefit to all concerned. He would therefore call upon Mr. Owen Fleming, the writer of the paper he had spoken of, to give a short statement of the ideas of the Association on the subject.

Mr. Owen Fleming said he had been desired by the Sub-Committee of the Architectural Association, having charge of this matter, to briefly indicate the reasons, which, after prolonged and careful consideration, were held by the Association to be of sufficient importance to the building industries of London, to render highly desirable a conference of those bodies who were interested in the maintenance of a high standard of workmanship in London buildings. Before doing so, he wished, on behalf of the Association to extend a warm welcome to the delegates who had been appointed, and to express the hope that their deliberations might result in a diminution of those difficulties which now appeared to hinder the London boy from obtaining a thorough mastery of his trade. He thought that they might congratulate themselves, because, although they represented widely varying, and, in some cases, possibly opposing interests, they were enabled to meet at that conference on the common ground of education, which stood entirely apart from the many grave questions affecting the relationship of capital and labour. These questions were entirely without the purview of the conference, and he was sure that they would facilitate the solution of the problem they had been appointed to consider if they unanimously accepted the resolution which was to be proposed, and which was to the following effect:—"That this conference do consider the practical and manual training of persons engaged or intending to be engaged in the building industries of London, and that it be an instruction to the chairman for the time being that matters not directly bearing upon this consideration be out of order, and that this resolution be not modified or rescinded except upon the unanimous vote of all the appointed delegates." This resolution would clearly mark out certain definite limits of possible inquiry, discussion, decision, and action, which would be of the greatest service to them in their deliberations, and he felt sure that it would be unanimously adopted. The agenda sufficiently indicated the magnitude of the task before them, even when they had adopted the resolution he had read. The first matter on the agenda was the advisableness of becoming a permanent committee, but they would probably find it desirable to postpone the consideration of that question until a later stage in the discussion. If they did this, after electing sundry officers, and not more than four co-opted members, they would proceed to the inevitable question of funds, and this would prove a somewhat difficult matter, because, although they might possibly obtain a room for their meetings, and rely on gratuitous secretarial help for a time, they could not hope to preserve a record of their proceedings, nor to carry on much correspondence or inquiry without some definite source of income to cover those expenses. If this difficulty could be surmounted, they would arrange their future meetings and discuss the admission of the Press, and then proceed to consider their relationship with the Technical Education Board. This was a question of some difficulty, because it was of great importance that they should in no way hamper the very excellent work that that Board was doing for technical instruction in London. It seemed their relationship with the Board should be that of cordial assistance, and that they should occupy a position of an advisory and consultative nature rather then one involving actual administration. This question having been settled, they would pass to Item No. 11 on the agenda, which was the crucial point of the whole matter. Under the two headings, apprenticeship and technical instruction, many interesting facts would probably be laid before the conference by the delegates. It was improbable, however, they would arrive at any other opinion than that neither apprenticeship nor technical instruction in their present forms were adequate for existing needs. It would be for them to find out

to what extent they failed, whether the restoration of apprenticeship was in any way possible, and whether technical instruction could be so developed as to take its place; whether the existing means of technical instruction were sufficiently practical, and whether the general regulation restricting classes to men actually engaged in the various trades was a right and proper one. That was an inquiry which would need all their patience and knowledge, but it was one which he submitted they ought to undertake. If they could succeed in indicating the direction of the solution of the problem, they would have taken a great step towards the establishment of a high standard of workmanship in the buildings of London. The remaining questions for them to discuss were, he thought, sufficiently explained in the agenda. The possibility of urging upon the London School Board the desirability of developing the work they are at present doing in the direction of manual instruction, the admirable work of the City Companies and the possibility of its extension, the question of enlisting the active efforts of the trade unions on behalf of workmanship, the influence of the South Kensington building-construction classes, the question of registration, and the possibility of organising competitions and meetings for discussion among workmen, were all points of the highest importance to workmanship, and deserved their closest attention.

Mr. Goldsmith then proposed the resolution, read by Mr. Fleming, who seconded it, and it was then agreed to *nem. con.*

The Chairman added that paragraphs 14 and 17 on the agenda would, by this resolution, be considered outside the scope of the conference, and would, therefore, be eliminated. These were with regard to the influence of trades unions upon workmanship, and the question of the overlapping of trades and consequent disputes and strikes.

On the motion of Mr. Burrows, Mr. Goldsmith was appointed hon. sec. of the conference.

It was next agreed that the item No. 2 on the agenda, for considering the advisability of a permanent committee, should be postponed.

The following four co-opted members were then agreed to, viz., Sir Philip Magnus, Alderman Taylor, of the London County Council; Mr. W. R. Lethaby, architect, and Mr. Thomas Holloway, of the Works Committee of the London County Council.

It was suggested that the following trades should also be represented at the conference, viz., hot-water fitters, mill-sawyers and wood-cutting machinists, general smiths, fitters and bellhangers, coppermiths, and the electrical trades.

Principal Wells, Battersea Polytechnic, wished to say a word from the point of view of the Polytechnics, which had in their classes something like 60 per cent. of the students attending the classes in the whole of the Metropolis. At a conference of the heads of the different Polytechnics which met some weeks ago, they considered what action they should take, as a collective body, on the question of the formation of a permanent committee. The only conclusion come to was that some of them should attend that evening and hear what was to be said. But their difficulty was somewhat of this character—they felt that any movement of this nature must have represented upon it the Polytechnic element, and the conference knew enough of their relations to the Technical Education Board to understand that in any step they took they must carefully consider what the Board had done, and were doing, in the same direction, and whether, as busy people, they could usefully ally themselves with so many associations or conferences of this kind. The Technical Education Board had quite recently called representative meetings to discuss the question, and had behind them an unlimited capacity for getting at representative people, so that they must feel some doubt as to whether the Architectural Association was best fitted to open such a big subject. At the same time, they felt that their life-work at present was to advance the cause of technical education in London, and if any conference asked for their help, it was their duty to give it. They were, however, somewhat puzzled to say "Yes" or "No" to the question.

Mr. Fleming said that a feeling had existed for some time amongst architects that the average workmanship of the present day was not what it should be. That feeling was brought to a head at the meeting of the Architectural Association on December 8, 1893, when it was felt that architects, as the leaders and directors of workmanship, ought to take up the matter, and see whether, by any action of theirs, it could not be improved. Mr. Fleming then quoted the opinions of several journals and representative men in favour of taking action in the matter, and concluded by proposing—"That it is advisable for this conference to become a permanent committee."

Mr. C. T. Millis, as representing the Borough Polytechnic Institute, felt they were dealing with the wrong point. He believed, indeed, they would be in a better position to discuss the question of the permanent committee at the end of the conference. He felt there was a need for something to be done for the education of the workmen, and many of them had been trying for a good many years to do something for the members of the building trade. They had gone through many troubles, and had encountered many obstacles, but at present they felt that they owed a deep debt of gratitude to the Technical Education Board, and also to the members of the central governing bodies of the London Polytechnics, for the opportunities put in the way of workmen for obtaining this technical education. During the last four years a great stride had been made in getting at workmen engaged in the building trades, and for that and other reasons it would not be advisable to vote at present on the question of the permanent committee.

Mr. Eva agreed with the last speaker as to the advisability of postponing the question.

Dr. Garrett remarked that something had been said as to the Technical Education Board hampering the action of other bodies, but he would be extremely sorry if it were supposed that the Board interfered with the efforts of educational societies or institutes. If, however, he were asked about the views of the Board with respect to this particular question, he would be inclined to say that when the question of appointing a representative to this conference was considered a few weeks ago, the Board in giving permission for a representative to attend, expressed opinions somewhat to the following effect: the Board would certainly welcome all suggestions, co-operation, and advice from a committee of this kind. They would also be glad to take part in any conference which was of a temporary character; but they were not, without further information, prepared to commit themselves to the appointment of a permanent committee, feeling, as they did, that if such a committee were made permanent it would have to exercise permanent functions which would be to a certain extent those of superintendence and control. The Board felt that there existed almost too many such controlling and inspecting bodies, and, in order to simplify that action or control, so far as the Polytechnics were concerned, they had joined in the establishment of the Central Polytechnic Council. The establishment of a permanent committee, which would be independent of any of the existing authorities, would be a step in the reverse direction to that which the Board had taken in connexion with the Polytechnics. The Board, therefore, would not be prepared to commit themselves, without further knowledge, to take part in the establishment of any such committee. At the same time, the Board hoped such an opinion would not in the least degree prevent the conference continuing its deliberations.

Mr. S. G. Bird confessed that he had not quite seen the necessity for this committee. Speaking as a member of one of the City companies, who had done much for technical education, he believed they knew as much about the subject as most people. The programme now laid before them was a very ambitious one, embracing a large area, and dealing with many subjects, and he was afraid, when he entered the room, they would soon come to a dead-lock. He thought it would be well to adjourn the meeting. He could hardly see what the usefulness of this permanent committee would be.

After some further discussion, the following motion was unanimously agreed to:—"That this meeting be adjourned, and at its next meeting it discuss what steps can be taken to further technical education."

On the motion of General Moberley, seconded by Mr. Cutler, a vote of thanks was passed to Mr. Mountford for his conduct in the chair.

The proceedings then terminated.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—On the 11th inst., a meeting of this institution was held at the Westminster Palace Hotel, Victoria-street, S.W., Mr. H. J. Young in the chair, when a paper on "Marine Engine Design of To-Day," was read by Mr. Henry M. Rounthwaite, M.I.Mech.E. In the discussion which followed, Messrs. W. Clifford Smith, H. Fraser, B. H. Joy, W. H. De Ritter, W. Hunter, and S. Boulding took part.

LIVERPOOL ENGINEERING SOCIETY.—At the fortnightly meeting of this society, held on the 9th inst., at the Royal Institution, the President, Professor H. S. Hele Shaw, M.Inst.C.E., in the chair, a paper was read by Mr. John A. Brodie, entitled "Tramways and Tramway Traction." The author, after a general *résumé* on tramways, dealt in detail with the question of permanent way, and then proceeded to discuss the relative merits of horse, locomotive, cable, and electrical traction, and the comparative costs of the systems. A discussion upon the paper terminated the proceedings.

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.—The ordinary fortnightly meeting of this Association was held on the 9th inst., in the committee-room of the Town Hall, when Mr. H. Higginson read a paper on "The Proposed Building By-laws of the City of Carlisle." He explained that upon consideration and with the approval of many members he had changed the proposed subject of his paper from "Building Construction" to the above on account of the peculiar pertinence of a paper on the proposed by-laws at the present time, and then went through them clause by clause, stating his opinions as to the advisability or otherwise of them. The chief points to which he took exception were the clauses requiring persons to submit elevations and plans and sections for the approval of the Urban Sanitary Authority, showing thereon the construction of the floors and roofs, with the sizes and particulars of the timber girders, columns and stanchions which they intended to use marked thereon; and the prohibition of the use of fanlights and skylights in water-closets, instead of windows. On the whole, the lecturer expressed himself pleased with the by-laws, and congratulated the City Surveyor (Mr. W. Howard-Smith, A.M.Inst.C.E.) on the successful framing of them. In the discussion which followed, attention was drawn to the stringency of the fire protection clauses, and it was pointed out that these extreme precautions were scarcely necessary in Carlisle.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At a meeting of the members of the Leeds and Yorkshire Architectural Society, held on the 14th inst., at the Mechanics' Institute, Leeds, a paper was read by Mr. J. W. Longfield on "Wrought Ironwork." The recent movement, he said, in favour of the increased use of wrought ironwork for electrical and domestic purposes in preference to the hard geometric productions of the foundry caused one to wonder whether the old and beautiful art of working iron would again become fashionable. As far back as the beginning of last century castings were intermixed with wrought iron, and gradually superseded it. There were, too, several other reasons why wrought iron fell into disuse. One was the passing of an Act of Parliament prohibiting the ornamental signs which had made the streets of London so picturesque. The lecturer concluded by urging the superiority of wrought iron-work over cast iron for both ornamental and practical purposes.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A paper by the Rev. Robert Scott Mylne, London, author of "The Master Masons to the Crown of Scotland," was read at a meeting, on the 9th inst., of the Edinburgh Architectural Association, on "The Architecture of Bologna and North-Eastern Italy." After glancing briefly at the history of the province of Bologna, Mr. Mylne said every traveller had heard of the leaning towers of the city of that name, and everyone went to see them. Nobody knew exactly why they were built, or what precise purpose they were intended to serve, and although extremely curious, neither possessed architectural merit like the famous marble leaning tower of Pisa. The numerous arcades formed the most interesting architectural feature of the quaint mediæval town of Bologna. Marble being scarce in the district, terra-cotta was frequently used for decorative purposes with much taste and skill. The capacious font of the Church of St. Marie dei Servi was one of the most remarkable examples of this kind. The long views of slender marble columns formed an elegant kind of arcade, and in front of the western façade formed a charming little quadrangle. The actual beauty of effect, however, was somewhat marred by the unfinished state of the main portion of the sacred edifice. In the Church of St. Bartholomew there was also a very well designed portico carved in stone by Lombard sculptors in the sixteenth century, from

the beautiful designs of Andrea de Formigine, executed A.D. 1530. In the same way many of the spacious residences of the old nobility presented magnificent specimens of Lombard and Renaissance architecture. The street fronts were often very noble, while the gateways, courtyards, staircases, and colonnades provided capital examples of detailed design. The beautiful private residence of highest merit in the whole city was the Palazzo Bevilacqua. Though there were other palaces in Bologna of larger dimensions than the Bevilacqua, and often possessing some particularly fine details, none as a whole excelled in merit that particular residence, which was a typical example of Bologna skill. Was not the due sense of proportion, there so well exhibited, just the very thing so often lacking in many fine modern buildings? Some of the fine houses in Bologna were chiefly noticeable for the interesting capitals of the columns on their open arcades towards the streets. The paper, which was read by Mr. Thomas Ross, was illustrated by a series of photographs. At the close the thanks of the Association were awarded to Mr. Mylne.

Correspondence.

To the Editor of THE BUILDER.

THE NEW DISTRICT COUNCIL AND THE PUBLIC HEALTH ACT.

SIR,—The difficulty respecting the meaning of the words "new building" has been overcome in the city of Sheffield by the insertion of the following clause in the Sheffield Corporation Act of 1890—viz.: "The making of any addition to an existing building by raising any part thereof or making any projection therefrom, but so far as regards such addition only" "shall for all the purposes of this Act or of the Sheffield Corporation Act of 1883 and of the Public Health Acts and of any by-law made thereunder respectively be deemed to be the erection of a new building."

It is curious to note that the Sheffield Corporation Act was enacted on August 14, 1890, and that the Public Health Acts Amendment Act, enacted on the 18th of the same month and year, does not contain any interpretation of "new building." EDWD. M. GIBBS.

Sheffield.

THE "SECRET CHAPELS" OF THE SORBONNE.

SIR,—Since the publication of my Notes on the above and of the sketch plan of the Dome (referred to in your issue of January 5), it is a matter of gratification to be able to chronicle the opening of the blocked entrance to the north-west Secret Chapel and the clearing away of the lumber from the passage to it from the transept—a clearance which has disclosed the chapel. There is no trace of the neat wainscoting referred to by Thiery, nor of the altar; the floor of the chapel is dust, its stones having evidently been taken away when the chapel was dismantled. There is a small square shallow hole in the west wall showing where the support of the picture was, and near the passage, on the east wall, is a plain piscina of 18 in. wide, by 18 in. high and 12 in. deep.

The outline of the blocked-up window is plainly visible, and there is an arch, similarly treated, in the west wall of the chapel, in the corner, which coincides with the centre of the altar in St. Joseph's Chapel. This strikes one as indicative of a former entrance into the Dome Chapel from that side, before the present altar to St. Joseph was erected.

There is no staircase now in the narrow round space as depicted by Blondel, whose plan accompanied my previous notes on the subject, nor does it seem possible, on examination, for one to have existed, but the staircase to the transept clock is in the corresponding pier on the other side of the transept. Blondel's plan, however, is slightly inaccurate as to the shape of the passage to the chapel.

I have been given the assurance that the chapel window will be reopened when the new quadrangle is more advanced.

I might here correct an error I made in my former notes. Richelieu's skull was replaced, in a mahogany box, in a cavity under the monument in the transept, and not in the place where he was buried, as the coffin was let down, unawares to everybody, into the disused sewer of Calvi, and at the Revolution his remains, minus the skull, were emptied into the sewer.

I may remark, in conclusion, that no pictures have been found in the Chapel at its recent disclosure, and that the picture of St. Paul recovering his sight, by Brenet (see Thiery, *loc. cit.*), was removed on the 23rd Frimaire, An. II., to the Comité Civil, "jusqu'à nouvel ordre," according to the Procès-verbal drawn up when certain coffins were moved from near the secret chapels.

JOHN A. RANDOLPH.

VESTRIES AND DRAINAGE.

SIR,—In view of the recent arbitrary action of vestries in respect of the drainage of private houses, whilst I think your correspondent on this subject in your last issue has but little ground for complaint, as it appears from his own account that his soil-pipe was not in any way ventilated, it may be helpful and instructive to note a recent decision on an application of the Paddington Vestry to have all the drain-pipes taken up because they would not stand the water test. The defendant had the drain tested by the most pungent scent tests, and without the slightest escape of the smell at any point. The drains were some feet deep, and it was represented that no drain in London would stand water pressure unless quite recently laid according to modern practice, and that it could not be established that any danger to health was to be reasonably feared. The magistrate took this view of the case, and decided against the vestry with costs.

"F.R.I.B.A."

*** The decision perhaps a reasonable one under the circumstances; but there are two sides to the matter. The water test is the most crucial, and therefore the most satisfactory, and the sooner all drains are laid so as to meet it the better.—ED.

ALTAR-TABLE AT TAWSTOCK.

SIR,—Would you be good enough to correct a misprint in my letter referring to Tawstock Church. "*Modern* altar-table" should be "*wooden* altar-table."

I wrote in haste, and probably my writing was not very distinct. CHAS. R. BAKER KING.

EXTERIOR PAINTING, ETC., TO LAW COURTS.

SIR,—Passing by the Law Courts a few days ago my attention was called to the very shabby state of the exterior of most of the doors, sashes, and frames, &c. Have they (the doors, &c.) been painted or varnished since the buildings were erected? If so, I should think the time has arrived for renewing the same. I did not stay to make an examination of the work, but I presume the oak doors were originally varnished, and the sashes and frames painted and varnished.

I do not know how they keep up the renovations to the Law Courts in Paris, but, I should think, better than we do. "AN OBSERVER."

THE NEW UNIONISM.

SIR,—In the *Builder* of January 5 is published a notice emanating from the master builders of London, stating "that no workman shall in future be placed under any disability by reason of either belonging or not belonging to a union." I am pleased that the master builders have at last taken action against the tyranny of trades unions. At the present time a workman goes to work at a shop or job in the building trade; he is asked for the Federation ticket; if he has not got one he is told he will have to get one, and that if he does not consent to do this, in a few hours every man will strike against him, and the result is he is discharged. The labourers will refuse to wait upon a non-federated workman, and it has often occurred that a labourer has refused to fetch a carpenter a handful of nails unless he showed a federation ticket—in fact, it is almost impossible to get a job without it. It is in this way men are forced into the unions.

It is high time the federation ticket is abolished, and I hope the masters will persevere and stop this un-English practice, for I am sure with a little encouragement and a firm promise of protection, with good faith, at least 50 per cent. of the members will be only too glad to escape from the clutches of their unions.

"A MEMBER OF A NON-FEDERATED UNION."

TRADE CATALOGUES.

THE "Crypto Works Co." send us their illustrated catalogue of electrical plant, which includes motors specially laid out for driving ventilating fans; an application of electrical power which is likely to receive increased attention now that the desirability of mechanical ventilation under many circumstances has been so largely recognised.——Messrs. Easton & Anderson send us their illustrated catalogue of lifts of all kinds—electric, hydraulic, and hand-power, for houses, offices, and warehouses; loading-out lifts, hydraulic cranes; and plant for the supply of water to country houses. These last include hydraulic rams, water-wheels, turbines, electric motors, engines, and windmills. The remarks and suggestions in this portion of the catalogue will be found useful.——From Messrs. Hamilton & Sons we have an illustrated catalogue of painting brushes of every kind, both for general painting and decorative work; as also paper-hangers' tools and materials.

The Student's Column.

BRICKS AND TERRA-COTTA.—III.

DISTRIBUTION OF BRICK-EARTHS.

THE distribution of the various earths employed in brick-making may be considered from two points of view, according as they are interstratified between solid rocks, or exist as mere superficial accumulations. The former may be conveniently subdivided and referred to specifically under the divers geological formations in which they occur. Commencing with the most ancient of these, as developed in England and Wales, we may say that practically no clays are found in the *Cambrian* and *Ordovician* rocks, for the simple reason that almost all the argillaceous deposits in them have been turned into slate. As the waste produced in quarrying this latter material, however, is now frequently made into bricks, we may just give an outline sketch of the districts where it is raised, including the slates which are classed in the *Silurian*.

Cambrian slates occur in all the main subdivisions of the formation, those in the Tremadoc being 1,000 ft. in thickness, and traceable from near that place to Dolgelly, in North Wales. Amongst *Ordovician* rocks we have the dark slates and shales of the Arenig Mountain, Arran Mowddy, Ffestiniog, and Cader Idris. The Arenig rocks of North Wales consist of iron-stained, black, and fine-grained dark grey slates, well developed near Portmadoc, and at places east of Ffestiniog. In South Wales, at St. David's they are principally black slates; whilst in the Lake District similar rocks occur in the Skiddaw area, at Longside, Keswick, Scaafel, and Whiteside. The precise geological age of the Leicestershire slates is unknown, but they are doubtless correctly placed about the horizon now under description; they are found at Swithland, Groby, &c. Thick masses of slate are characteristic of the Bala group.

Passing now to the *Silurian*, the fine, smooth, light-grey or blue slates, which have been traced from the mouth of the river Conway into Carmarthenshire, are well-known, in the division known as the Tarrannon shale. Then there are the grey and black shales of the Wenlock series, which outcrop on the banks of the Severn near Coalbrookdale, and stretch across Radnorshire, almost to Carmarthen; in the Malvern Hills they are estimated to be 640 ft. in thickness, and more than double that to the north. Speaking generally, the Wenlock beds of North Wales and Westmoreland are chiefly shaly and indurated, in places even passing into slate; whilst in South Wales they are softer, and consist of true shales and sandstones. The shale of the Ludlow division of the *Silurian* is a prominent feature in the escarpments which range through Shropshire and in parts of Montgomeryshire, in the neighbourhood of Welshpool, and is 750 ft. thick in places. The sub-division called the Ledbury shales include grey, red, and purple marls, shales, &c., west of the Malvern chain.

With these the Lower Palæozoic rocks are brought to an end. There can be no doubt that the shales in the upper divisions alluded to—those of Tarrannon, Wenlock, Ludlow, and Ledbury—are suitable for brickmaking. To a certain extent they are utilised for that purpose, but to nothing like what they might be. It may be objected that, as a rule, they are too hard to become readily plastic, which is decidedly the case over parts of the areas alluded to, though even there the application of a little machinery would soon overcome the difficulty. In the more or less mountainous tracts in which these *Silurian* shales are found there is frequently an abundant water-supply, which, with but little engineering skill, could be converted into power for driving the machinery connected with any brickworks that may be established. We shall have to allude to the composition of shales later on, but it may be noted that several of the shales now under discussion are suitable for the manufacture of high-class fire-bricks.

The argillaceous deposits of the *Devonian* rocks are few and far between. In North Devon, however, the formation is largely composed of slates and shales of purple, grey, and olive-green tints, in the vicinity of Ilfracombe, Barnstaple, and Lynton, and these are of enormous thickness. Very little attempt has hitherto been made to work them for brick-making purposes, though both in Devon and Cornwall the best-cleaved portions yield excellent slates at Delabole, near Camelford, at Tavistock, and elsewhere.

Carboniferous rocks are largely drawn upon for

various materials used in the manufacture of bricks, and are especially noteworthy as yielding fire-clays. These, accompanying coal-seams, are frequently obtained from mines, and occur in almost every district where coal-mines are situated. The principal counties wherein fire-clays are actually worked, arranged in order of magnitude of output, commencing with the most important, are as follow:—Durham, Stafford, York, Glamorgan, Northumberland, Lancashire, Denbigh, Flint, Worcestershire, and Monmouthshire. Fire-clay usually lies beneath the coal-seams in layers, varying in thickness from a few inches up to several feet. It is found in most abundance, and generally of best quality, beneath the coal used for coking and manufacturing purposes. The same useful material is largely exploited in mines in Scotland also, especially in Lanarkshire, Ayrshire, Edinburghshire, Fifeshire, Stirlingshire, and Renfrewshire. In Ireland the only fire-clay obtained from the *Carboniferous*, also worked in mines, is from County Tyrone. In addition to clay suitable for refractory goods, the *Carboniferous* formation yields several excellent earths adapted for the manufacture of ordinary bricks, more particularly in Denbighshire and Lancashire. Nevertheless, extensive tracts exist in which clays of this age are well developed and suitable for better-class burnt goods, but which are hardly touched. The most important of these are the Lower Limestone shales and clays of the west of England and thin clays in the upper *Carboniferous*. Excellent bricks are made from a material known as gannister, found in association with coal-seams in Durham, Yorkshire, &c.

The marls of the *Permian* formation have been largely utilised for brickmaking in certain areas in the Midlands. The marls of the *Triassic* also furnish abundant material for making bricks and pottery wherever they crop out in the Midlands and elsewhere. The latter frequently contain thin beds of light greenish marl with a considerable proportion of carbonate of lime—not a very desirable constituent in many instances, at least in large quantities. The same formation occasionally yields clays suitable for the manufacture of terra-cotta. The vast majority of clays and marls of *Triassic* age are red, with a tendency to mottling in some localities.

We come now to the great mass of clay and marl forming the bulk of our *Liassic* rocks. From these a very large proportion of English bricks are made, and the material is suitable for their manufacture at almost any point along their outcrop from Lyme Regis in Dorset, through Somerset and Gloucestershire up into Northamptonshire and Lincolnshire, and on through Yorkshire to Redcar. The material naturally varies a great deal from place to place, and the quality of the bricks produced is, consequently, an uncertain factor, except in localities where the manufacturers understand these little peculiarities, and are prepared to cope with them as they arise, by judicious admixtures of other earths, or as the case may be. Mr. Horace B. Woodward remarks * that some of the clays are too calcareous, more especially those which alternate with the limestones in the basement portions of the lower *Lias*. In other cases, shells and small calcareous nodules render the clays unsuitable. The *Lias* clays frequently contain iron pyrites—a very objectionable feature—which have to be removed in the preparation of the raw earth for the manufacture of good bricks. Some of the best bricks from this formation are said to be made at Hill Moreton, near Rugby. Most of the lower *Lias* clays are stiff and calcareous, or shaly; there are seldom any beds of loam interstratified with them, such as are best adapted for brickmaking. Mr. Woodward states, however, that milder or loamy earths are to be found in the lower part of the middle *Lias*, and such beds are worked south of Allington, near Bridport, near Ilminster and Glastonbury, at Stroud, Banbury, and other places. The upper *Lias* is very extensively worked for making bricks, tiles, &c., from the neighbourhood of Banbury, northwards through Northamptonshire to Lincolnshire.

The estuarine clays of lower *Jurassic* age are well-developed in Northamptonshire and Lincolnshire, where they in places yield excellent materials for brickmaking, as at Stamford, Great Oakley, Water Newton, Wood Newton, between Stanion and Brigstock, and between Pilton and Luffenham. At Little Bytham, also, bricks of singular hardness and durability have been made for many years from the Upper Estuarine series; occasionally, as at Wakerley, fire-clay occurs, which is also suitable for the manufacture of terra-cotta, though we do not know how far this material has been worked there in recent years, as there is no official record of the same in the "Mineral Statistics." The Bradford clay, so-called from the development of the formation in the neighbourhood of Bradford-on-Avon, in Wiltshire, also gives good brickmaking material.

Omitting a few minor clay beds we come to the great argillaceous mass called the Oxford clay, of middle *Jurassic* age, the maximum thickness of which is about 600 ft. It persists as an irregular belt several miles in width across its outcrop from the Dorset coast to that of north-east Yorkshire. It consists mainly of layers of stiff blue and brown clay from which millions of bricks are made annually, but the material usually requires very careful preparation to turn out really good work. With reference to this, Professor Judd remarks * that in the Northamptonshire and neighbouring areas the Oxfordian series is extensively dug for brick and tile making. The materials thus produced vary considerably in quality at different places, owing to the great range of differences in mineral character which the clays from the several horizons in this formation present when compared with one another. The most conspicuous of these differences consists in the proportion and quality of the sand occurring in admixture with the plastic mass. The Kellaways beds, a member of the same series, have produced many bricks at Oundle, Southwick, Benefield, Warmington, and other places, and Professor Judd says it is believed that the bricks made from them are of better quality than those manufactured from Oxford clay, especially in respect to the amount of heat which they will bear.

There is very little difference in lithological character between the Oxford and Kimeridge clays, though the latter comes from the upper *Jurassic*. It has a geographical extension from the Dorset coast to Yorkshire, running parallel to the outcrop of the Oxford clay, and is about 600 ft. in thickness. Brickyards occur all along the route, dotted at convenient intervals, mostly in the vicinity of the larger towns.

The *Weald* clay, so extensively developed in Kent and Sussex, which reaches a thickness of 1,000 ft., is largely employed in brickmaking in the counties mentioned. It consists of a vast series of fluviatile or estuarine deposits, mostly impure clays of dark colour. We shall have occasion to describe these more in detail when speaking of chief brickmaking centres.

The *Gault* clay, a dark, stiff, blue, argillaceous bed, sometimes sandy, or calcareous, with pyrites and phosphatic nodules and occasional beds of green sand, varies in thickness up to 250 ft. It extends as a sort of fringe round the denuded anticline of the Weald of Kent and Sussex, and, generally, conforms to the outcrop of the base of the chalk, following that formation into the Isle of Wight on the south and trending in a north-easterly direction up into Cambridgeshire. It is found also as isolated patches on older rocks here and there. Gault bricks are proverbial, but the name is often made to apply to others than those made of the *Cretaceous* clay now under discussion. In the vicinity of Cambridge are several brickyards, the sections in some of which are of considerable depth; the clay is not particularly arenaceous, but sufficiently so for making the commoner kinds of brick, in manufacturing the better qualities, sand has nearly always to be added.

The mottled clays of the *Reading* series, lacustrine deposits, have been used for many years in brickmaking near Reading, and from that place at divers points up to Croydon; also on the western flanks of the London basin. The *Woolwich and Reading* beds also yield raw material suitable for making fire-bricks, as at Ewell, near Epsom. In the Hampshire basin, these mottled clays are much employed.

The *London Clay*, extending all over the London basin, is very largely drawn upon, as every one knows, for making bricks.

Of the remainder of the Tertiary beds we need only mention the *Bagshot* and *Headon* series, the former in the London and Hampshire basins, and the latter in the Hampshire alone, which have been utilised to a limited extent for brickmaking. The pipeclays and potters' clay of the middle Tertiary of Dorset, used in the manufacture of terra-cotta, were alluded to in the last article.

The only geological deposits of any note not yet described are the various brick-earths found in broad river valleys, which belong to a very recent period, and have, in fact, been laid down since man inhabited these islands. These are the superficial accumulations alluded to at the commencement of this article. They are so very generally spread, and vary so much in character, that it is impossible to sum up their chief features in a few words. They are extensively employed, and any special observations will be reserved until the materials used in the manufacture of various kinds of English bricks are described in detail.

* Memoirs of the Geological Survey. "The Jurassic Rocks of Britain," vol. iii. (1893), p. 298.

* Memoirs of the Geological Survey: "Geology of Rutland." 1875. p. 239.

GENERAL BUILDING NEWS.

NEW THEATRE, KILBURN.—A new theatre is to be built at Kilburn, at a cost of 17,000*l.*, which has been designed by Mr. Frederic W. Fryer, of Westminster, under whose direction the building will be carried out. It will seat 1,700 persons. The style adopted is French Renaissance. A public hall, to be called the "Queen's Hall," is to be erected on a site adjoining the above, from designs by the same architect, at a cost of 13,000*l.*

CIRCUS BUILDING, LEEDS.—This building was erected for the annual exhibition of the Leeds Smithfield Club Cattle Show, certain provisions being included in the design so as to convert it into a circus. It is 335 ft. long and 142 ft. wide, or an area of 5,300 square yards. The height of roof at sides is 14 ft. and at ridge 40 ft. This is supported on pillars from 7 in. to 11 in. square. The centre transept is 42 ft. wide, with two aisles on each side, all 25 ft. wide, making up the total of 142 ft. Eight of the above pillars had to be left out to form the chariot ring, which is 190 yards round it, and these spaces, each 48 ft. span, are bridged across on the cantilever principle by beams, stays, and struts, all 4 in. by 11 in. The trick ring is 44 yds. round it. The building proper contains nearly 300 tons of timber, and was erected in sixteen days, the roof principals for centre transept having been put together previously. The contractor was Mr. William Walker, of Leeds. Mr. William N. Wynn, C.E., of Leeds, was the architect.

THE BUILDING TRADE IN GLASGOW IN 1894.—The special feature of the building trade in Glasgow during last year was that it was exceedingly busy. The number of tenement buildings erected in Glasgow during 1894 has been very great, particularly in the suburbs. Red stone seems the favourite material now used for all classes of buildings.

SCHOOL EXTENSION, COVENTRY. — Additions are being made to Bablake School, Coventry. These consist of the provision of two separate buildings, one a lecture theatre, and the other a shop for woodworking. The lecture theatre will be 25 ft. wide and 40 ft. long, and has a connected preparation-room 10 ft. wide and 18 ft. long. The room is wainscotted by pitch-pine dado. It will be heated by hot-water coils, and the gas-fittings will be iron and ornamental, and the whole of the joinery work is of pitch-pine. The main entrance is by folding doors leading from the main corridor of the present school buildings. The two buildings are in the rear of the present schools. The architect for the work is Mr. H. W. Chattaway; the contractor, Mr. C. Haywood, jun.; and the clerk of the works, Mr. F. Morgan.

SCHOOL BUILDINGS, CARDIFF.—On the 9th inst. Mr. Lewis Williams, J.P., chairman of the Cardiff School Board, opened the elementary school premises recently erected in the vicinity of Roath Park. The accommodation in the school is as follows:—Girls, 380; boys, 380; infants, 478; total, 1,238. The buildings consist of the infants' school, a one-story building, and the boys' and girls' school, the girls' school being on the ground-floor and the boys' on the first floor. Besides the school buildings there are covered playing-sheds and sanitary offices, and a caretaker's house. The buildings are constructed of rubble masonry, faced with brickwork, with terra-cotta and red Carlisle stone dressings. The floor of the boys' school is of concrete and iron, and the schools are planned on the class-room principle with wide corridors, and, as far as possible, communication has been provided between the rooms, independent of the corridors. The work has been carried out by the contractor, Mr. Harry Gibbon. The architect is Mr. E. W. M. Corbett, and the clerk of the works was, during the earlier part of the work, Mr. T. Wale, who died when the work was about half done. For the remainder of the time the work has been under the supervision of Mr. Gardner.

PUBLIC SCHOOL, WISHAW, LANARKSHIRE.—On the 15th inst. Wishaw new Public School, which has been erected by the Cambusnethan School Board at a cost of 11,000*l.*, was opened by Mr. James Houldsworth, of Coltness. The new school is designed in the Grecian style, and is built of red sandstone from Dumfriesshire. It stands facing Main-street. The main building is two stories in height, and measures 106 ft. in length by 86 ft. in breadth. Internally the centre is occupied by a rectangular hall rising through both stories, with galleries all round above. This hall will be used for marshalling and drilling the children. The accommodation for scholars comprises seventeen class-rooms, with places for 1,064 pupils. Special provision is made for secondary education. There

are four teachers' rooms provided in the building. The arrangements for heating and ventilation have been carried out on the propulsion system, the motive power being supplied by a gas engine in the basement. The building has been erected from plans prepared by Mr. Robert A. Bryden, architect, Glasgow.

SANITARY AND ENGINEERING NEWS.

SALFORD SANITATION: GOVERNMENT INSPECTION.—During the past three years the Local Government Board, through its medical inspector, Dr. Bruce Low, has instituted a series of inspections as to the sanitary conditions of our larger towns, with special reference to the prevention of cholera infection, and the isolation of such cases as may occur in spite of precautions. Recently the inspector examined the various sanitary works carried out by the Salford Corporation, and at a special meeting of the Health Committee convened for the purpose of receiving his report and recommendations, he expressed great satisfaction with the works already executed. He stated that the recently-erected model lodging-house was the best of its kind that he had seen. The artisans' dwellings, the hospitals for the isolation of infectious diseases, the very extensive works connected with the interception and treatment of sewage, and the destructors erected for the burning of dry refuse, showed that the Corporation were alive to the requirements of the health of the borough. It would, therefore, not be necessary for the Local Government Board to issue any instructions to the Corporation, other than such observations as the inspector might think fit to make at that meeting. He wished to remind them that the advent of the Ship Canal now rendered Salford more liable than before to become infected with cholera, as a port having shipping relations with all parts of the world. He would urge upon the authority the desirability of extending the water-closet system, or where the pail system was in use, he would recommend that the amount of refuse contained in each pail be reduced to a minimum. The sanitary authority should continue to relay such sewers as were found to be defective, and in no case should rain-water pipes be allowed to act as ventilators to the sewers. With respect to the condition of the dwelling-houses, attention should be directed to the questions of ventilation and freedom from dampness.

FOREIGN AND COLONIAL.

FRANCE.—As might have been foreseen, the Municipal Council of Paris has definitely refused the Metropolitan Railway scheme.——M. Peter, the sculptor, has executed a medallion portrait in silver of M. Puvis de Chavannes, which is to be presented on the occasion of a grand banquet to be given in honour of the distinguished artist having attained his seventieth birthday.——The Minister of Fine Arts has been paying a visit to the new Sorbonne buildings, during which he presented the architect, M. Nenot, with the Grand Cross of the Legion of Honour.——The *Journal Officiel* publishes in full the report of M. Guadet on the competition for the 1900 Exhibition.——M. Detaille has been appointed President of the Société des Artistes Français (the Old Salon) in place of M. Bonnat, who has resigned, and been elected honorary President. M. Ernest Barrias and M. Ch. Garnier have been elected Vice-Presidents.——The "Nord" Railway Company is about to carry out extensive works, at a cost of more than ten million francs, for the extension of the Paris terminal station, which is insufficient for the traffic.——The Association of "Architectes Diplomés par le Gouvernement" has awarded to M. Umbdenstock (pupil of M. Guadet) the medal which they offer to the student of the year who has received the largest number of awards at the École des Beaux-Arts.——The jury of the competition for the new Ecole Coloniale at Paris has given its award. The execution of the building is to be entrusted to M. Maurice Yvon, Architect to the Colonial Department. The second premium has been awarded to M. Masson Detourbet, and the third to M. Rochet. The building will be erected in the Avenue de l'Observatoire, at the corner of Rue Auguste Comte. There were fifteen competitors.——The new station at St. Cloud, built to replace the old wooden erection, is now completed.——M. Jules Suffit, an official architect under the Paris Municipality, has died rather suddenly.——The death is also announced of M. Hippolyte Noël, painter, and a professor at the Museum of Natural History, at the age of sixty-six. He was a member of the "Société des Artistes Français," and an annual exhibitor at Champs Elysées Salon.——We have to record also the death, at Paris, of an esteemed painter of Still Life subjects, M. Guillaume Fouace, pupil of M. Yvon. He also was an exhibitor at the Champs Elysées, and obtained an honourable mention in 1884, a third medal in 1891, and a first medal in 1893. He was also a talented sculptor, and was mentioned under this title at the Salon of 1890.

GERMANY.—The Emperor has expressed his approval of the statue of the Hohenzollern princes for the White Saloon of the Imperial Palace at Berlin, and has conferred decorations on the following artists: Messrs. Ihne, Geyer, Lessing, Schaper, Boese, Schott, Toberentz, Calandrelli, Eberlein, Unger, Hundreiser, and Baumbach. Professor Calandrelli was also presented with the Gold Medal for Art. By 1897 the statues are to be executed in marble.——Four marble statues, representing respectively Fishery, Navigation, Agriculture, and Commerce, have been set up in the vestibule of the Berlin Town Hall.——The Ginsberg prize for 1895, founded in memory of the artist of that name who perished in the earthquake at Ischia, has been awarded to the painter von Brandis and the sculptor Karl Reinerf.——The Baden Government has decided to remove the Observatory from Carlsruhe to Heidelberg, where it will be more in touch with the University. The observatory buildings are to be erected on the Gaisberg at a cost of about 11,500*l*.——The cathedral at Trèves is to be restored; the necessary funds will be provided by a lottery, which has been sanctioned by the Government.——Oldenburg is to be placed in direct water communication, *viâ* the new Dortmund-Ems Canal, with the Westphalian coalfields. To effect this, improvements will be made on the canalised Hunte, and the Hunte and Ems canal.——A bronze bust of Herr von Stephan, by the sculptor Kusthardt, of Hanover, has been set up at Emden, the site of the chief submarine telegraph office.——At the first winter meeting of the German Archæological Institute at Athens, Dr. Dörpfield lectured on the results of last year's excavations at Hissarlik, the site of ancient Troy, undertaken under his direction.——Dr. Julius Nane, of Munich, has now completed his investigations, commenced in 1881, of the tumuli between the Ammer and Staffel lakes in Bavaria. In all 306 graves were opened, and large numbers of finds obtained. Dr. Nane assigns the oldest graves to a period of 1400–1200 B.C.——The Emperor has approved of Hermann Prell's designs for the wall-paintings in the Great Hall of the Palazzo Caffarelli, the site of the German Embassy at Rome. The pictures, three in number, represent the wooing of Gerda, in the Northern Legend symbolical of the Earth, by Freyr, the Sun-God. The same artist's wall-paintings for the stairway of the Silesian Art Museum at Breslau, which are also mythological in design, have recently been unveiled.——The Works Committee of the 1896 Exhibition has been authorised to conduct a lottery of 4,000,000 tickets of one mark each, for the benefit of the Exhibition funds. The prizes will be chosen from the exhibits. It has now been decided that amongst the "attractions" of the Exhibition there will be a Street in Cairo and an aquatic show.——The new St. Paul's Church, in the suburb of Schoneberg, has been consecrated in the presence of the Emperor and Empress. The edifice, which is carried out in red brick and lighted by electricity, provides seating accommodation for 1,540 worshippers. Baurath Schwechten is responsible for the plans.——The Stralau Treptow Tunnel Railway has been sanctioned by the Police authorities.

MISCELLANEOUS.

DIARIES FOR 1895.—We have received from the office of the *Estates' Gazette* (6, St. Bride-street, E.C.) a diary and directory for the use of surveyors, auctioneers, and land and estate agents, for 1895, which is the thirteenth edition of the directory and the eighth edition of the diary and directory combined. The work, which is admirably got up, contains a list of the principal auctioneers, land and estate agents in London and the country, names and addresses of members of the Surveyors' Institution, the Auctioneers' Institute, and the Institute of Estate and House Agents; also a list of the important compensation claims which have been made of late years for property compulsorily acquired, and other information of value to surveyors and auctioneers and house-agents. The work is well bound and conveniently arranged.——The *Sanitary Record* has presented to its subscribers a diary for 1895, a copy of which has been sent to us. The chief aim of the editor has been, we are told, to make it a handy and compendious *vade mecum* for medical officers of health, sanitary inspectors, and all sanitary officials; a book in which they may not only record the appointments and doings of each day, and be reminded of duties which the recurrence of particular dates imposes upon them, but to which they can turn with confidence for facts, figures, statistics, suggestions, instructions, references, legal decisions, addresses, text-books, and the manifold other hints and helps for which they would otherwise need to have recourse to a whole library of books. The diary contains a useful article on sanitary legislation in 1894, and other information of interest to sanitary officers. The price of the work to non-subscribers is 2s. 6d.——We have received from Messrs. Chas. Straker & Sons (Bishopsgate-avenue, E.C.) a copy of their "Engineering and Machinery Diary, 1895." The work, which has been compiled by Mr. J. Stephen Jeans, contains formulæ, tables, &c., for the use of users of machinery. It appears to be a useful business diary.

CENOTAPH, CAMBORNE.—A cenotaph of yellow magnesia limestone, with a plain border of polished red Dartmoor granite, has just been placed in the wall over and above the grave of an infant daughter of Mr. John H. Holman, at Camborne. The memorial is square, and has within it a large circular panel deeply sunk, and containing a modelled and carved figure of a kneeling angel holding an ornamental shield, upon which an inscription occurs. The work has been carried out by Messrs. Harry Hems & Sons, Exeter.

NEW PLUG-CHAIN FOR LAVATORY BASIN.—Messrs. Winn & Co. (Birmingham) have produced a small patent which may be useful. The object is to avoid the inconvenience of the chain to the plug of a fixed lavatory basin. The chain passes through a hole at the back of the basin (just above the rim), and is weighted so as to be drawn back as soon as the plug is removed from the plug-hole; the chain disappears, and draws the plug up after it to the rim of the basin. The only fault to be found with this is that a plug that has worn loose, or is not very tightly fitted into the plug-hole, may be drawn out when it is not intended.

WELLS' "INDUSTRIAL" OIL LAMP.—This lamp, of which an illustration and description have been sent to us by Messrs. A. C. Wells & Co., of Medland-road, is a "regenerator" lamp stated to give a brilliant and steady light from ordinary petroleum or kerosene. A special point claimed for it is that there are "no glass chimneys to break," three mica windows or panes replacing the usual glass cylinder.

THE SLATE TRADE.—The upward tendency of prices still continues, the recent advance (as we mentioned in November last) being a moderate and reasonable one, fully warranted by the state of trade, but at the same time not sufficient to provoke competition. In most parts of Lancashire, and in the Glasgow district, trade has been especially brisk, and fair in all parts of the kingdom. The German trade also has kept up, the only serious falling off being in the Australian market, caused by financial troubles in those colonies. The labour market has also been in a satisfactory state, the men earning good wages, and there have been no strikes. The opening of the Manchester Ship Canal has had a beneficial effect, though not perhaps in the manner contemplated by the Canal Company, as it has caused a considerable reduction in railway rates to Manchester and the adjoining districts. The system of buying from "hand to mouth," to which we have before called attention, acts most prejudicially to all concerned, and it would be well if builders and contractors would give longer notice of their requirements to their merchants, as during the past year several buildings have been kept waiting for weeks for the particular kind of slates required—a difficulty easily explained when the number of different sizes, qualities, and colours of slates are considered.

FLUSHING SEWERS.—From Mr Jas. Lovegrove's annual report to the Board of Works for the Hackney district it appears that in this district the tank system of flushing sewers has now been in operation ten months and has worked well. The water as now discharged from the tank exerts a much more powerful effect in scouring the sewers than the system hitherto adopted. The tank, which contains 1,800 gallons, is placed near the flushing shaft, then charged from the hydrants, and when full discharged through a 9-in. tube. It takes about twenty minutes to fill, and discharges in three minutes.

THE "KALLIO" IMPROVED GULLY.—This is a gully more especially for scullery and kitchen waste, its special feature being a contrivance to reduce the exposed surface of water on which fat may be floating, and thus to do away with one source of nuisance. The waste water enters the gully through an inverted conoid, leaving a circular opening in the centre, and the majority of the standing water surface in the gully is around the opening orifice and closed in by the top of the conoid, only the surface under the central circular orifice being exposed. There is a handle for lifting the conoid cover for cleaning it. The gully is made by the House Sanitation Company.

SANITARY INSPECTORS' ASSOCIATION.—In connexion with the course of lectures and demonstrations for sanitary officers arranged by the Sanitary Inspectors' Association, Mr. S. G. Fairchild, R.P.C., delivered the first of two lectures on "Details of Plumbers' Work," at St. James's Hall, Piccadilly, W., on Saturday evening last. Mr. Thomas presided. The lecturer first dealt in some detail with the metals used by the members of the plumbing craft, exhibiting tables showing the relative tenacity, malleability, ductility, fusibility, and specific gravity of these metals. He spoke of zinc as being the most unsuitable metal in common use for the purpose of sanitary work. Dealing with soil-pipes, he said lead was without doubt by far the best material for such pipes. In the hands of a skilled plumber it could readily be manipulated to fit any desired position, with the advantage of the preparatory work being executed on the job. It was smoother than iron, and when properly constructed of drawn pipe, and ventilated, it was not affected by the various gases and acids passing through it. Moreover, lead was far more durable than any other metal in common use, and less liable to incrustation, and when jointed by means of wiped soldered joints, the soil-pipe branches, lead-traps, and anti-syphoning pipes practically became one homogeneous mass, perfectly gas- and watertight from end to end. Another great advantage lead pipes possessed was that they could be easily fixed in any position without difficulty, either outside or inside a building, and in the most artistic manner, to corre-

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Petty Sessions Court	Richmond (Surrey) T.C.	21*l.* and 10*l.* 10*s.*	Feb. 8
School Buildings	Haworth (Yorks.) Sch. Board	10*l.* for 2nd; 5*l.* for 3rd	Feb. 11
*Infectious Diseases Hospital	Penzance Town Coun.	31*l.* 10*s.* 21*l.* and 15*l.* 15*s.*	Mar. 19
Workhouse and Infirmary	Ipswich Union	100*l.* 50*l.*	Mar. 25

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Houses, Hall-lane, Armley	Leeds Indus. Co-op. Soc.	*Official*	Jan. 22
Bridge, Yates-street, Oldham	Lancs. & Yorks. Ry.Co.	do.	do.
Warehouse, Talbot-road, Blackpool	do.	do.	Jan. 23
Bridge Improvements, Brynsaddler, near Cardiff	Glamorgan C. C.	do.	do.
Diversion and Road Improvements, Nantgarw	do.	do.	do.
*Fitting-up Mortuary	St. Giles (Camberwell) Guardians	do.	do.
*Granite Pitching	Mile End Old Town Vestry	J. M. Knight	do.
Flagging, Channelling, &c.	Birkenhead Corp.	C. Brownridge	do.
Four Houses and Shops, Shambles-street, Barnsley		Wade & Turner	do.
Additions, &c. to Wesleyan Schools, Barnstaple	Rev. S. Cox		Jan. 24
Pipe Sewer, Rushall	Walsall Rural District Council	T. T. Fisher	do.
Fireclay Pipe Sewer (9,500 yds.), Beith	Ayrshire C. C.	Warren & Stuart	Jan. 25
Four Hundred Tree Guards	Wood Green Urban District Council	C. J. Gunyon	do.
*Police Barracks, Watford	Hertford C. C.	U. A. Smith	do.
*Granite Kerbing	Southall-Norwood Urban Dist. Council	*Official*	do.
Improvement Works, Sully-terrace	Penarth Urban Dist. Council	E. J. Evans	Jan. 26
Paving, near Church	Jarrow U.S.A.	J. Petrie	do.
Road Metal	Elgin County Council	*Official*	do.
*Additions at Neepsend Station	Sheffield United Gas Light Co. Lim.	F. W. Stevenson	do.
Forming, Paving, &c. Calendar-street and others	Blackburn Corp.	G. W. Lund	Jan. 28
Sewerage Works	Staines Urban District Council	G. M. Lawford	do.
Public Hall, Newbridge, Mon.	Mynyddislwyn Sch. B.	W. Price	do.
Schools, Newbridge		G. Rosser	do.
Additions, &c. to County School, Beaumaris	Governors	Evan Thomas	Jan. 29
*Seventy Garden Seats and Iron Railings	Willesden Dist. Coun.	O. Claude Robson	do.
*Road Works	Lewisham Bd. of W.	*Official*	do.
*York Paving	Tottenham Urban Dist. Council	P. E. Murphy	do.
*Making-up Roads	Fulham Vestry	C. Botterill	Jan. 30
*Supply of Stone and Oil	Bexley Urban District Council	E. R. Roulter	do.
Schools, near Havant, Hants	Bedhampton Sch. Bd.	G. C. V. Inkpen	do.
Brick and Pipe Sewer, Land's End to Marsh-row	Middleton (Lancs.) Crp.	H. L. Hinnell	do.
*Drainage of Club House	Nottingham County Club	R. E. Middleton	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
New Roads, Derrycrib, co. Galway	Congested Dist. Board (Ireland)	*Official*	Jan. 30
Road Works, Bunacurry	do.	do.	do.
Building Work at Farmhouse, Newton-by-Tattenhall, Cheshire	Governors of the Darnhall School	do.	do.
Road Metal (1,200 cub. yds.)	Motherwell (N.B.) Commrs.	do.	Jan. 31
*Supply of Iron Fencing	Borough of Croydon	do.	do.
Sewering, Levelling, &c. High-street, Tynewydd, Glam.	Ogmore and Garw Dist. Council	H. D. Williams	do.
Dairy Buildings, Bythesea Estate, Trowbridge	North Wilts Dairy Co.	W. H. Stanley	do.
Additions, &c. to Meltham Hall, near Huddersfield		Kirk & Sons	do.
*Works and Materials	Chelsea Vestry	T. W. E. Riggens	do.
Making up Camden-road and others	Wanstead Urban Dist. Council	*Official*	Feb. 1
*Works and Materials	St. Marylebone Vestry	do.	do.
*Broken Stone, Kerb, &c.	do.	do.	do.
*Broken Granite	Norfolk County Coun.	T. H. B. Heslop	Feb. 2
Chapel, Glanadda, Bangor, North Wales		R. Glynne Davies	do.
*Chimney-Shaft and other Buildings	County of London and Brush Prov. Electric Lighting Co. Lim.	C. S. Peach	Feb. 4
Waterworks, Clones, Ireland	Town Commissioners	J. H. H. Swiney	do.
*Alterations &c. to Schools	Warwick National Sch. Managers	F. H. Moore	do.
*Bessemer Steel Tram Rails	Manchester Corp.	*Official*	do.
Church, Longford, Ireland	Rev. G. W. Rea		Feb. 5
*Repairs to Engine	Brentford U.D.C.	N. Parr	do.
*Additions, Downsell-road Schools	Wanstead School Bd.	J. T. Bressey	Feb. 6
Passenger Stations, Warehouse, &c. York	N. E. Ry. Co	Wm. Bell	do.
*Warehouse at Prince of Wales Dock	Swansea Harb. Trust.	O. E. Schenk	Feb. 7
*Construction of Waterworks	Bilston Urban Dist. Council	B. Latham	Feb. 9
*Buildings at Bournemouth	Royal Counties Agricultural Society	*Official*	do.
*Brick Sewers	Rawtenstall & Bacup Joint Sewerage Com.	H. A. Cutler	Feb. 16
*Police Offices, Cells, Court, &c	Rotherham Corp.	R. J. Lovell	Feb. 20
Warehouse, Stables, &c. near Blyth, Northumberland	Cambois Co-op. Soc.	Davidson & Bendle	No date
Hotel and Stabling, Chopwell, near Blackhill, Durham	Consett Iron Co. Lim.		do.
Additions to School, Vennel-street, Plymouth	T. N. Andrews		do.
Four Shops and Houses, Aber, Cardiff		Chas. Taylor	do.
Six Cottages, New-street, Wigan		R. F. Johnson	do.
Schoolroom, Cowbridge-road, Cardiff		E. Seward	do.
Villa, Dinas Powis, Glam.		W. H. D. Caple	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Clerk of Works, Oldham	Uppermill Urban Dis. Council	2*l.* 10*s.* per week	Jan. 21
*Engineer's Assistant	Tottenham U.D.C.	150*l.*	Jan. 28
*Engineer, Main Sewerage Works	Manchester Corporation (Rivers Com.)	4*l.* 4*s.*	Feb. 4
*Instructors in Woodwork	Sch. Bd. for London	100*l.* &c.	do.
*Surveyor and Inspector of Nuisances	East Barnet Valley U.D.C.	300*l.*	Feb. 8

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv., vi., viii., ix., x. *and* xxi. *Public Appointments, p.* xviii. *and* xix.

spond with any particular feature in an architectural design. Although a hard and strong material, iron was not so durable as lead, being gradually rusted away by the action of the acids in the waste products and gases arising therefrom passing through them. Several methods had been tried for the protection of iron from rusting, and some of them appeared to be fairly successful for pipes used for the conveyance of drinking water, but it did not follow that when sewage and gases arising therefrom passed through them the result would be the same. The speaker strongly condemned the use of light iron water-pipes for soil-pipes. Zinc, he added, should not be used for soil-pipes, ventilating pipes, or waste-pipes on account of its sensitiveness to change of temperature and inability to resist the destroying effects of acids and gases, however weak and diluted. Copper was a good material for soil-pipes, but too expensive for general use. Alluding to the position of soil-pipes, Mr. Fairchild favoured the fixing, as far as possible, of soil-pipes outside in preference to inside of buildings. In the event of leakage taking place, through bad workmanship or accident, either of sewage or gases, the harm would be minimised by the offensive vapours escaping in the open air. After referring to syphonage and various kinds of traps—mechanical, grease, lip, bell, and "D" traps—the lecturer turned his attention to joints, the strength and soundness of which in plumbers' work, he said, was of the utmost importance, no matter how superior in quality or substance the materials of which the pipes were made. Exhibiting one form of joint, which he recommended, he observed that, as someone remarked, this was not in accordance with the London County Council by-laws, but these by-laws were not calculated to improve plumbers' work. It was quite evident the Council could not have had any expert evidence as to which were the best kinds of joints, or they would not have tied plumbers down to practically two forms. The Council did not appear to trouble themselves what sorts of joints were used.—Mr. Fairchild's second lecture will be delivered on Saturday, the 26th inst.

SMOKE ABATEMENT QUESTION AT SHEFFIELD.—The monthly meeting of the Sheffield City Council was held on the 9th inst. at the Council Chamber, Surrey-street, when Alderman Bramley referred with gratification to the Health Committee's proposals for dealing with the smoke nuisance, but said it would be better if the committee would also take into account the question of limiting the emission of the light-coloured as well as black smoke. Alderman W. J. Clegg having replied that the committee had not power to deal with any other than black smoke, went on to give particulars of the committee's proposals, and their interview with a deputation from the Smoke Abatement Association. At the present time the committee allowed an emission of four minutes' black smoke per hour, and the whole of the observations taken by the Smoke Abatement Association gave only 4·1 minutes of dense smoke per hour. Twenty-eight observations gave six minutes' emission of smoke, and although it was true that one observation gave fifteen minutes' emission of smoke and upwards it was scarcely fair to take a solitary case. On the whole, the association's observations did not much differ from those reported to the committee. Out of the thirty or forty observations made on behalf of the committee in regard to one chimney, there were in three instances fifteen to seventeen minutes of smoke, and notices requiring abatement were given. Had the observations been confined to the borough he believed the percentage would have been less. He believed the committee would work with the association if the latter chose to continue making observations. The committee now recommended that "in future the following limit be substituted for that of December 29, 1892, in dealing with the emission of black smoke from engine-chimneys, viz.:—Where there is one boiler attached to chimney, two minutes per hour; where there are two boilers attached to chimney, three minutes per hour; where there are three boilers attached to chimney, four minutes per hour; where there are four boilers or more attached to chimney, six minutes per hour." The committee were unanimously of opinion that where there was only one boiler, or where the boilers could be steadily used, no black smoke at all ought to be emitted, but they had fixed the time limit in order to allow for accidents.

LEGAL.

MOTION TO RESTRAIN THE ERECTION OF A WALL.

ON the 12th inst., in the Chancery Division of the High Court, the case of Defries *v.* Bell came before Mr. Justice Chitty on a motion for judgment. Mr. Solomon appeared on behalf of the plaintiffs, Messrs. Defries, glass-lamp and gas-burner makers, who were seeking an injunction restraining the defendants from erecting a wall or any structure so as to obstruct the access of light to the plaintiffs' showroom at 147, Houndsditch, E.C., or to darken the plaintiffs' ancient skylights. When the defendants were beginning to erect the wall in question (said Mr. Solomon), the plaintiffs remonstrated with them, and after negotiations had been entered into, a letter was written. This letter allowed the defendants to go to a certain height, equivalents being given in return, the defendants saying that they would not build higher than Fortescue's building. After the letter, however, defendants erected a wall to a greater height than mentioned in the letter, and the plaintiffs applied for an interlocutory injunction, which was granted. The order was served upon the defendants, who lowered a portion of the building, but not as low as was mentioned in the letter, and the access of light to the plaintiffs' ancient skylights, it was alleged, had been materially obstructed.

His Lordship granted a mandatory injunction, perpetually restraining the defendants from erecting any structure so as to darken the plaintiffs' ancient lights, with costs against the defendants.

LIVERPOOL COURT OF PASSAGE:

January 9, 1895.

ARCHITECT'S CLAIM FOR WORK DONE.

KIRBY *v.* THOMPSON.—This was a claim by the plaintiff, Edmund Kirby, F.R.I.B.A., F.S.I., architect and surveyor, of Liverpool, for 21*l.* from the defendant, John Joseph Thompson, of Formby, for work done as a surveyor and valuer. The plaintiff was represented by Mr. Horridge, and the defendant by Mr. Broadbridge. Mr. Horridge stated that in August, 1891, the plaintiff had several other claims in hand, and was engaged by the defendant to survey and enter into negotiations for and to endeavour to effect a sale of the property known as 35, 37, and 39, Whitechapel, and 51, Cumberland-street, the site of which, containing about 207 square yards, was required by the Government for the new Post Office, The plaintiff negotiated a long time for the sale of the property with a Mr. Cross, a surveyor, of Manchester, who represented the Government, but he was unable to come to terms owing to the defendant refusing to name a price. He also prepared plans, and otherwise assisted Mr. Wainwright, a Liverpool surveyor, to value the property. Mr. Wainwright's valuation was 5,320*l.*, including 10 per cent. for compulsory sale. Defendant, however, plaintiff said, wanted 9,000*l.* Plaintiff could not honestly have valued the property at anything like 9,000*l.* The defendant then seemed to have heard that Mr. Bradley, a Liverpool solicitor, had obtained 40*l.* a yard for adjoining property (a price which included compensation for loss of trade fixtures and business). He thereupon brought in Mr. Bradley, and the plaintiff said he had better do nothing further in the matter. Mr. Kirk, solicitor, was afterwards called in, and Mr. Hartley, surveyor, was asked to value the property, which he did at 5,300*l.* The price ultimately agreed to was 5,000*l.*, and 500*l.* for costs. Plaintiff, cross-examined by Mr. Broadbridge, said he found he was dealing with a man who had an exalted idea as to the value of his property. The defence was that the plaintiff was employed to make a valuation, and failed to supply it. The jury, without retiring, gave a verdict for 75*l.* damages, his Lordship granting permission for the plaintiff to amend his claim. Mr. Broadbridge asked that execution might be stayed to give the defendant an opportunity of appealing, on the ground that the Court had no power to grant leave to amend. The necessary order was granted.

CAPITAL AND LABOUR.

THE LONDON BUILDING TRADE.—There is nothing fresh to report as to the situation in the London building trade, nor is there any likelihood of anything happening until May 1 next. Neither the Master Builders' Association nor the London Building Trades' Federation have the least desire or intention of taking any action before that date. It has been somewhat hastily assumed that when May 1 arrives we are likely to have a great strike in London. In this connexion it should be remembered that the dispute in 1892 was amicably settled by a conference, although some of the points at issue were very grave ones, and there is no reason to doubt that when a conference is held in May next the same conciliatory spirit will prevail. At least, it is quite certain that both sides will go into the conference to consider the alteration in the rules which the master builders desire with a wish to come to an amicable settlement. A statement has appeared in some of the papers from the National Free Labour Association on the matter. It should be pointed out that the issue of that statement was entirely unauthorised, and is repudiated by the Master Builders' Association.—*Daily Chronicle.*

MEETINGS.

FRIDAY, JANUARY 18.

Architectural Association. — Mr. John Slater on "Bricks." 7.30 p.m.

Incorporated Association of Municipal and County Engineers (*Metropolitan and District Meeting*).—(1) Mr. W. N. Blair on "Private Drains or Public Sewers" (2) Mr. R. Godfrey on "Combined Drainage." 7.30 p.m.

SATURDAY, JANUARY 19.

Royal Institution.—Mr. Lewis F. Day on "Stained Glass Windows and Painted Glass—from the Point of View of Art and Craftsmanship." I. 3 p.m.

Queen's College, Cork. — Mr. Arthur Hill on the "History of Architecture." VII. 3 p.m.

MONDAY, JANUARY 21.

Surveyors' Institution.—Mr. H. Blackbourn on "The London Building Act, 1894." 8 p.m.

Royal Academy of Arts (*Lectures on Painting*).—Professor J. E. Hodgson, R.A., on "Development of Italian Art from the Fifteenth Century to the Death of Raphael." V. 8 p.m.

Society of Arts (*Cantor Lectures*).—Professor Silvanus P. Thompson on "The Arc Light." II. 8 p.m.

Architectural Section of the Glasgow Philosophical Society.—Mr. F. N. Newbery, Headmaster, School of Art, on "A Look into the Workshops, Past and Present." 8 p.m.

TUESDAY, JANUARY 22.

Institution of Civil Engineers.—Papers to be further discussed: (1) "The St. Gothard Mountain-Railway and the Stanzerhorn Cable Railway," by Mr. Sigvard J. Berg; (2) "The Monistrol-Montserrat Rack-Railway," by Mr. Alfred Collett; (3) "The Usui Mountain-Railway, Japan," by Mr. C. A. W. Pownall; (4) Paper to be read, time permitting—"Boiler Explosions," by Mr. William H. Fowler. 8 p.m.

Glasgow Architectural Association.—Paper by Mr. J. A. Morris, entitled "An Architectural Chat." 8 p.m.

WEDNESDAY, JANUARY 23.

Carlisle Architectural, Engineering, and Surveying Association.—Mr. S. W. B. Jack on "Some of our Cathedrals." 8 p.m.

Northern Architectural Association.—Mr. W. Milburn on "The Monuments of Egypt." 7.20 p.m.

Liverpool Engineering Society.—Paper by Mr. W. W. Beaumont. 8 p.m.

THURSDAY, JANUARY 24.

Society of Antiquaries.—8.30 p.m.

Royal Academy of Arts (*Lectures on Painting*).—Professor J. E. Hodgson, R.A., on "Development of Italian Art from the Fifteenth Century to the Death of Raphael." VI. 8 p.m.

Institution of Electrical Engineers. — Mr. J. E. Kingsbury on "The Origin and Development of the Telephone Switch Board." 8 p.m.

FRIDAY, JANUARY 25.

Institution of Civil Engineers (*Students' Meeting*).—Mr. F. E. Wentworth-Sheilds "On the Strength of Large Graving-Docks." 8 p.m.

Royal Institution.—Sir Colin Scott-Moncrieff on "The Nile." 9 p.m.

SATURDAY, JANUARY 26.

Royal Institution.—Mr. Lewis F. Day on "Stained Glass Windows and Painted Glass—from the Point of View of Art and Craftsmanship." II. 3 p.m.

Sanitary Inspectors' Association (*St. James's Hall*).—Mr. S. G. Fairchild on "Details of Plumbers' Work." II. 7.30 p.m.

Queen's College, Cork.—Mr. Arthur Hill on the "History of Architecture." VIII. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,157.—ARTIFICIAL MARBLE: *H. Lake.*—This material is stronger, has better appearance, and withstands the action of the weather better than artificial marble made in the usual way. Gypsum, quartz, and felspar are heated, then cooled and triturated, mixed in a powder and made up as marble in the ordinary way.

1,359.—LOUVRE CHIMNEY-TOP: *F. R. Strover.*—From the disposition of holes and louvres around the chimney-top in rough weather the wind is prevented from entering the flue from the top by striking the reversed louvres and passing through the inside of the chimney-top to the outside.

10,274.—GLAZING: *H. C. Board.*—Wires or metal rods are placed upon the roof at required distances from each other, extending from one end to the other of the building or erection to be covered, or from intermediate bars or frames to each other; on these metal clips are placed which hold the sheets of glass, &c.

1,928.—FACED BRICKS, TILES, &C.: *W. H. Richards, &c.*—A new kind of brick or tile, a combination of an ordinary burnt or other brick or tile, with a layer or facing of glass or metal attached to the sides. The face of the brick is specially hardened and polished by a somewhat elaborate process.

21,056.—BRICKS: *S. J. Adams.*—These are "keyed" or dovetail bricks; they have dovetails which give bond without the use of hoop-iron bands, and do not depend entirely on the adhesion of the mortar.

21,058.—STAIR-TREADS: *W. Gooding.*—The stair-tread is a metallic plate, with a series of perforations to receive the wearing blocks, the whole being arranged to give more wear, while not increasing the thickness of the plate.

21,360.—WINDOWS: *F. de Lasa.*—A reversing sash, claiming to "make a practical structure of the more or less imperfect and impractical structures hitherto proposed." Mechanical details are given by which the usual fittings are utilised.

NEW APPLICATIONS FOR LETTERS PATENT.

JANUARY 1.—54, G. Chisholm, jun., Sanitary Pipes.—63, A. Boult, Joints for the Planking of Wooden Structures.—84, F. Marriott, Ornamental Tiles.—85, E. Prew, Utilising the Heat resulting from combustion which ascends the chimneys of buildings.

JANUARY 2.—97, F. Armstrong, Screw-down Tap.—99, W. Warner, Double-trapped Gulleys.—108, J. Osmouth, Kilns.—116, C. Pryce, Prevention of Scum and other Discoloration on Terra-cotta and other Clay Goods.—159, J. Jones and others, Water Waste-preventers or Flushing Apparatus.

JANUARY 3.—170, H. Scurfield, Testing the Efficiency of Ventilation.—186, G. Brown, Windows.—205, H. Worsey, Door-latches.—216, H. Wood, Bricks.

JANUARY 4.—232, W. Easun, Soil-pipe Exhaust to draw the Sewer-gas of Ventilating-pipe from Drains and diffuse it.—233, G. & G. Burgrim, Window and Casement-fasteners.—244, G. Stenning, Handle for Screw-drivers.—251, W. Greenslade, Plough and Sash Fillister Plane.—263, G. Goller, Chisels for Working Wood.—279, W. Ward & Sons, Lim., and W. Ward, Tile-making Machines.

JANUARY 5.—306, H. Wall, Pigments or Colours.—316, G. Collins, Kiln.—321, J. Weir, Steel Point for Stone-cutters.—324, J. Foster, Kilns.—325, J. Horrocks, Smoke-preventers.—353, H. Kämper, Safety Bolts.

PROVISIONAL SPECIFICATIONS ACCEPTED.

23,276, C. Sears, Fasteners for Window Sashes, Casements, &c.—23,473, H. Baden, Water-closets.—24,642, W. Waldron, Wall-paper Printing Machines.—24,646, J. Gabriel, Cement.—24,663, L. Marsden, Chimney-tops.—24,704, W. Moor, Flooring or Boxings for Hearths.—24,705, J. Hazlehurst and P. Jackson, Chimney-tops or Ventilating Terminals, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.

4,309, G. Anderson, Stone-Dressing Machinery.—4,530, J. Chadwick and E. Preston, of the firm of Stone & Co., Ventilating Appliances for Sewers.—23,076, J. Harrison and J. Robinson, Automatic Catch or Holder for Doors, &c.—23,526, J. Barnsley, Traps for Baths, Lavatories, &c.—23,610, W. Walks, Draught, Dust, and Weather Excluder.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JANUARY 10.—By *Stimson & Sons:* "The Joiners Arms," Westminster Bridge-rd., Lambeth, f., r. 100*l.*, 2,600*l.*; 2 to 36 even, Barbel-st., f., 4,020*l.*; 81, Tower-st., f., 235*l.*; 7, Lower Marsh, l., r. 64*l.*, 840*l.*; 8 and 9, Lower Marsh, c., r. 68*l.*, 870*l.*; 10, Lower Marsh, together with the premises called Hamilton-yd., in rear, c., r. 170*l.*, 1,130*l.*; 11 and 12, Lower Marsh, c., r. 85*l.*, 1,190*l.*; 2, 4, and 6, Rouel-rd., Bermondsey, u.t. 36 yrs., g.r. 7*l.* 10s., 475*l.*; Wild's Rents, "Bowes Spelter Works," f., area 10,500 ft., 1,350*l.*; 49 and 51, Hows-st., Kingsland, u.t. 24½ yrs., g.r. 6*l.*, r. 77*l.* 10s., 400*l.*

JANUARY 11.—By *Furber, Price, & Furber:* 22, Great Coram-street, Bloomsbury, u.t. 5 yrs., g.r. 20*l.*, r. 65*l.*, 85*l.*; 42, Great Coram-st., u.t. 5 yrs., g.r. 20*l.*, r. 68*l.*, 85*l.*; 6 and 8, Park-ter., Regent's Pk., u.t. 26 yrs., g.r. 25*l.* 4s., r. 96*l.* 12s., 730*l.*; i.g.r. of 22*l.*, Sale-st., Paddington, u.t. 27 yrs., g.r. nil, 270*l.*; 12 and 13, Aberdeen-pl., Maida Vale, u.t. 28 yrs., g.r. 7*l.* 7s., r. 107*l.*, 845*l.*; 202 and 204, Arlington-rd., Camden Town, u.t. 17 yrs., g.r. 10*l.*, r. 55*l.*, 300*l.*; 53, Marchmont-st., Brunswick-sq., u.t. 4 yrs., g.r. 13*l.*, r. 60*l.*, 80*l.*; 67, Marchmont-st., u.t. 4 yrs., g.r. 13*l.* 13s., and 18, Compton Mews, u.t. 11 yrs., g.r. 4*l.*, entire r. 68*l.*, 150*l.*; 58, Compton-st., u.t. 10 yrs., g.r. 17*l.*, r. 60*l.*, 300*l.*; 15 and 16, South-cres. Mews, Burton-cres., u.t. 11 yrs., g.r. 6*l.* 6s., r. 21*l.*, 35*l.*; i.g.r. of 26*l.*, High-st., Camden Town, u.t. 16 yrs., g.r. 2*l.*, 230*l.*; i.g.r. of 59*l.*, u.t. 17 yrs., g.r. 9*l.*, 540*l.*; i.g.r. of 20*l.*, 5, Rutland-st., Hampstead-rd., u.t. 29 yrs., g.r. 7*l.*, 200*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a, for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/c/o	0/0/0
Teak, E I. ..load	10/0/0	16/0/0
Sequoia, U.S. ft. cu	1/10	2/2
Ash, Canada load	3/0/0	4/5/0
Birch, do.	3/0/0	4/5/0
Elm, do.....	3/15/0	5/0/0
Fir, Dantsic, &c.	1/10/0	3/0/0
Oak, do.....	2/15/0	4/15/0
Canada	5/5/0	6/15/0
Pine, Canada red	2/15/0	3/5/0
Do. Yellow	3/10/0	5/15/0
Lath, Dantsic, fath	4/10/0	5/10/0
St. Petersburg..	5/0/0	6/10/0
Wainscot, Riga, &c., log	2/15/0	5/0/0
Odessa, crown....	2/15/0	5/0/0
Deals, Finland 2nd & 1st std 100	7/0/0	9/0/0
Do. 4th & 3rd ..	7/0/0	8/0/0
Do. Riga	7/0/0	8/10/0
St. Petersburg, 1st yellow ...	9/10/0	12/0/0
Do. 2nd yellow	7/10/0	9/0/0
Do. white	8/0/0	10/10/0
Swedish	7/0/0	15/10/0
White Sea.....	6/10/0	14/0/0
Canada, Pine 1st	21/0/0	24/10/0
Do. do. 2nd....	16/10/0	17/10/0
Do. do. 3rd, &c.	7/10/0	10/10/0
Do. Spruce, 1st..	8/10/0	10/0/0
Do. do. 3rd and 2nd	6/10/0	7/10/0
New Brunswick	6/0/0	7/0/0
Battens, all kinds	5/0/0	21/0/0
Flooring boards, sq., 1 in. prep. 1st.....	0/9/6	0/14/0
Do. 2nd	0/7/0	0/11/6
Other qualities—	0/5/0	0/7/0
Cedar, Cuba ..ft.	/3	/4
Honduras, &c.	/3	/4½
Mahogany, Cuba	/3	/6
St. Domingo, cargo av.	/3	1/6
Mexican do. do.	/3	/4
Tobasco do. do.	/3	/6
Honduras do...	/3½	/5½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio	7/0/0	18/0/0
Bahia	6/0/0	17/0/0
Satin, St. Domingo	0/0/5	0/1/0

TIMBER (*continued*).		
Satin, Porto Rico	0/0/6	0/1/0
Walnut, Italian....	0/0/3½	0/0/7

METALS.		
Iron—Pig, in Scotland .....ton	2/1/7	0/0/0
Bar, Welsh, in London	5/12/6	5/15/0
Do. do. at works in Wales.....	5/2/6	5/5/0
Do. Staffordshire, in London.....	6/0/0	6/10/0
COPPER—British cake and ingot	43/0/0	43/10/0
Best selected ..	43/15/0	44/5/0
Sheets, strong..	51/10/0	0/0/0
Chili bars	40/12/6	40/17/6
YELLOW METAL lb	0/0/4½	0/0/4¾
LEAD—Pig, Spanish ....ton	9/12/6	9/13/9
English com. brands	9/13/9	9/15/0
Sheet, English, 6 lbs. per sq. ft. and upwards ..	10/15/0	11/0/0
Pipe	11/15/0	0/0/0
ZINC—English sheet .....ton	18/10/0	19/0/0
Vieille Montagne	19/10/0	0/0/0
TIN—Straits.....	58/17/3	59/7/6
Australian.....	59/10/0	60/0/0
English Ingots.	63/0/0	63/10/0
Banca	61/10/0	62/0/0
Billiton	60/10/0	61/0/0

OILS.		
Linseed .....ton	20/0/0	20/7/6
Cocoanut, Cochin	25/10/0	0/0/0
Do. Ceylon	23/15/0	0/0/0
Palm, Lagos	24/0/0	0/0/0
Rapeseed, English pale	21/10/0	0/0/0
Do. brown	20/0/0	20/5/0
Cottonseed ref. ..	17/10/0	18/10/0
Oleine.....	21/10/0	22/10/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	5/0/0	12/0/0
TAR—Stockholm barrel	1/1/0	0/0/0
Archangel.....	0/13/0	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

ACCRINGTON.—Accepted at a schedule of prices for excavating, sewering, levelling, paving, &c., for the Corporation. Mr. Wm. J. Newton, C.E., Borough Engineer, Town-hall, Accrington:—
George Adams, Rhyddings-street, Oswaldtwistle—seven streets.
William Hindle Bury, Union-road, Oswaldtwistle—one street.
George Cunliffe & Son, Water-street, Accrington—one street.

BELFAST.—For timber and concrete wharf, coal-shed, &c., for Messrs. Neill, Bangor, Co. Down, Ireland. Messrs. Russell & Lockwood, engineers and architects, 16, Waring-street, Belfast. Quantities by Mr. Thomas Wilson:—

Clark	£10,468	0	0	M. Green	£6,900 13 0
H. & J. Martin, Ltd.	7,651	0	0	W. J. Campbell & Son, Belfast*	6,603 0 0
Brebner	7,625	11	0	Geo. Lawson & Son	6,378 5 9
Workman & Co. ..	6,954	10	0	Stitt	6,137 9 0

* Accepted on reductions.

CARDIFF.—For the erection of a residence, Cefn-Coed, Roath Park, for Mr. J. W. Hibbert. Mr. Edwin Seward, architect, Queen's Chambers, Cardiff:—

Jones & Thornley ..	£3,911	4	7	Chas. C. Dunn.....	£2,818 0 0
W. Best & Co.	3,744	0	0	E. Turner & Sons ..	2,788 0 0
D. C. Jones & Co....	3,626	0	0	Harry Gibbon	2,734 0 0
Knox & Wells.....	3,575	0	0	Edgar Groom	2,730 0 0
Shepton & Sons....	3,250	0	0	E. R. Evans Bros., Cardiff (accepted).	2,687 0 6
Jas. Allan	3,104	0	0	Lissaman	2,680 0 0
David Davis.....	3,072	0	0	W. Bowers & Co. ..	2,665 0 0
Williams & Hoare..	2,910	0	0		

CARLISLE.—Accepted for new tun and cooling-rooms for the Carlisle Old Brewery Company, Limited. Mr. H. Higginson, architect, 23, English-street, Carlisle. Quantities by the architect:—

Building.—J. & R. Bell	£470 0
Joinery.—Jos. Plaskett	241 0
Plumbing.—W. Forster	15 5
Concreting.—S. Ferguson & Sons	325 0
Slating.—C. J. Hanson	63 0
Painting.—R. Westray	24 0
Ten Fermenting Tuns.	
Woodwork.—Jos. Plaskett	184 0
Copper-lining, &c.—R. P. Hodgson & Co., Edinburgh	336 0
Total	£1,658 5

CHEARSLEY (Bucks.).—For new farm-buildings at Chearsley, near Thame, and alterations, &c., for Mr. E. H. Vincent. Mr. W. F. Taylor, architect, Aylesbury:—

C. Crook	£678 0	Joseph Rose	£571 0
J. Holland	677 5	B. Holland	571 0
Webster & Cannon	645 0	Wells & Son	559 18
W. W. Howland	605 0	Mayne & Son, Aylesbury*	534 0

* Accepted.

FARNBOROUGH.—For new Police-station, Farnborough, Hants. Mr. James Robinson, County Surveyor, architect, Winchester:—

		Additional for cubicles.
Cooke & Co.	£3,420 0	£49
Stephens, Bastow, & Co., Lim.	3,298 0	35
Claridge & Bloxham	3,108 0	28
W. Hughes	2,934 10	25
Musselwhite & Son	2,890 0	30
J. H. Cooke	2,379 0	33
A. Tennant	2,878 0	28
G. Kemp	2,717 0	31
J. Pool & Son, Hartley Wintney, Hants*	2,650 0	29
T. Martin	2,330 0	28

* Accepted.

INVERNESS (N.B.).—For the construction of a steel lattice girder-bridge on stone abutments and c.-i. cylinder-piers, over the River Ness, for the Town Council of Inverness. Mr. J. A. Mackenzie, Burgh Surveyor, Inverness. Quantities by Burgh Surveyor:—

Handyside & Co., Lim.	£12,916 6 1	Alex. Finlay & Co.	£7,875 0 0
Chas. Brand & Son	12,081 3 3	Sir Wm. Arrol & Co., Lim.	7,731 16 3
Hanna, Donald, & Wilson	9,333 0 0	Cleveland Bridge & Engineering Co., Lim.	7,725 0 0
Murdoch & Cameron	8,952 0 0	Somervail & Co.	7 541 16 6
Tees Side Iron and Engine Works	8,927 12 5	Crossley, Tilburn, & Co.	7,400 6 8
Arrol's Bridge and Roof Co., Lim.	8,771 15 8	Inverness Foundry Co., Lim.	7,131 0 0
Head, Wrightson, & Co. Lim.	8,685 7 10	Stockton Forge Co, Lim.	7,098 6 0
George Lawson & Sons	8,207 18 6	Northern Agricultural and Implement Foundry Co., Lim., Rose-st., Inverness*	6,985 10 8
P. & W. Maclellan, Lim.	7,957 15 7		
Workington Bridge and Boiler Co. Lim.	7,940 3 0		

* Accepted.

KIDDERMINSTER.—For laying about 563 ft. of 15-in. earthenware pipe-sewer, Park-lane, for the Town Council. Mr. Arthur Comber, Borough Engineer, Town Hall, Kidderminster:—

George Law ..... £477 | Thos. Vale, Stourport* £375

* Accepted.

LEEDS.—For additions, &c., to the "New" Inn, Woodhouse-street. Mr. Wm. N. Wynne, C.E., 10, Livingstone-street, Roundhay-road, Leeds:—

Scarfe	£150 0	Richard Burns, Camp-road, Leeds (accepted)	£115 0
Jackson & Meakin	144 10		
Hargraves	122 10		

LONDON.—Accepted for the erection of boundary-walls, gates &c., at the Edmonton Union, for the Guardians. Mr. T. E. Knightley, architect, 106, Cannon-street, E.C.:—

Walter Lawrence, Waltham Abbey £328

LONDON.—For the supply of road materials for Victoria Park, for the London County Council:—

Tuff & Miskin	£681 13 4	W. Griffiths	£509 15 10
R. Ballard, Lim.	633 15 0		

LONDON.—For alterations and decorations at No. 41, Coleman-street, E.C., for McConquodale & Co., Limited. Mr. H. Phelps Drew, architect, 29 and 30, King-street, E.C.:—

F. Sage & Co.	£282 10	Colls & Sons (accepted)	£234 0
T. Osborn & Sons	235 0		

[All of London.]

LONDON.—Accepted for new ice stores, Ransome's Dock, Battersea, for Messrs. Slaters, Limited. Mr. C. R. G. Hall, architect:—

B. Cooke & Co., Battersea £2,800

LONDON.—For rebuilding 1, Ship Yard, Wardour-street, for Mr. H. Cole. Mr. R. H. Kerr, architect, 132, Oxford-street, W.:—

Linton	£1,084 2 6	Johnson & Manners	£787 10 0
M. Manley	832 0 0	Nightingale	743 10 0
Bywaters	825 0 0	Vernall, Danes, & Co.* (accepted)	717 0 0
Turner & McKay	809 0 0		

LONDON.—Accepted for constructional and sanitary work at 69, Harley-street, W., for Hon. Claude Portman. Mr. Fredk. W. Hunt, architect, 30, York-place, Portman-square:—

Vernall, Danes, & Co. £2,329

LONDON.—For rebuilding 94, High-street, Marylebone, for Mr. W. J. Parker. Mr. J. Randall Vining, architect, Rolls Chambers, Chancery-lane:—

Holloway	£1,193	Vernall, Danes, & Co.*	£1,175

* Accepted.

LONDON.—Accepted for works in connexion with new staircase and other alterations at 70, Prince's Gate, S.W., for Mr. E. C. Hambro. Mr. A. William West, architect, 44B, Maddox-street, W. Quantities by Messrs. Dunk & Bousfield, surveyors, Billiter-square Buildings, E.C.:—

T. G. Trollope & Sons £700

LONDON.—For building stables and coach-house at Grove-lane Camberwell. Mr. E. J. Strevens, architect:—

Reed	£520 0	Simpson & Cove*	£378 0
Freeman	519 0	Coleman	372 7
King & Son	380 0		

* Accepted.

LLANDAFF. — For levelling, paving, metalling, flagging, channelling, &c., certain streets in the Parish of Llandaff, for the Llandaff and Dynas Powis Rural District Council. Mr. W. Fraser, engineer, 270, Cowbridge-road, Canton, Cardiff:—

Jones & Thornley	£2,738 12 1	Ed. Williams	£2,116 4 0
Wood & Son	2,656 0 0	Barnes, Chaplin, & Co.	2,100 4 9
Thos. Harris	2,579 5 0	John Mackay, Newport, Mon.*	1,989 0 0
Frank Ashley	2,436 18 7	E. J. Ince (too late)	1,879 0 0
J. Rich	2,329 15 8		
J. Brock	2,278 2 6		
John Rees	2,168 1 0		

* Accepted.

NEATH (South Wales).—For the construction of sewerage works, for the Rural District Council. Mr. W. E. Classen Thomas, A.M.Inst.C.E., Post Office Chambers, Neath. Quantities by the Engineer:—

H. C. Parfit	£24,805 0 0	Barnes, Chaplin, & Co.	£12 094 11 2
David Jenkins	16,735 2 7	William Jones	11,927 10 2
Batchelor & Snowdon	14,519 15 8	T. S. Gregory	11,459 7 11
Gardner & Happerfield	14,663 6 6	James Allan	11,253 18 1
John Mackay	12,828 2 6	G. Rutter & Co.	10,851 10 10
Thomas, Watkins, & Co., Ltd.	12,621 0 0	David Evans & Co.	10,828 3 0
James Dickson	12,245 10 7	R. C. Brebner, Edinburgh*	10,678 2 7

* Conditionally accepted.

[Engineer's estimate, £10,828 5 5]

NEWBURY.—For the supply of Mendip granite road-metal, for the Corporation. Mr. E. A. Stickland, Borough Surveyor, Town Hall, Newbury:—

	Per ton. s d		Per ton. s. d.
Clee Hill Dhu Stone Co.	13 2	Tuttle Hill Granite Quarries	9 0
Lime Roadstone and General Trading Co., Kingston*	11 9	W. B. Beauchamp	7 6
Charles Abell	11 0	John Wainwright & Co.	7 5
Exors. W. G. Roberts	9 10	Westbury Iron Co., Ltd.	7 4
		Somerset Quarry Co., Frome*	7 2

* Accepted for 500 tons each.

NORWICH.—Accepted for the supply and delivery, at Trowse Station, c.-i. pipes, sluice-valves, &c. Mr. Arthur E. Collins, C.E., Guildhall, Norwich:—

	Pipes. Per ton.	Air-vessels. Per ton.
Jas. Oakes & Co., 21, Wharf-rd., City-rd., N.	£6 17 6	£10 10 0
	Penstocks. Per ton.	Sluice-valves. Per ton.
J. Blakeborough & Son, Brighouse	£15 5	£19 15

SOUTHEND.—For making good, &c., Ashburnham-road, Napier Avenue, Gordon-road, and road leading from Park-road to Park-street, Southend-on-Sea, for the Corporation:—

	Ashburnham Road.	Back of Park Road and Park Street.	Gordon Road.	Napier Avenue.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Kent Road Maintenance and Stone Supply Co.	480 9 2	308 19 2	493 4 2	531 16 4
J. Broderick & Co.	447 15 4	284 2 6	413 5 0	386 11 0
G. Whimpey & Co.	412 5 2	297 8 2	469 14 8	506 10 2
J. Jackson & Sons	350 1 0	255 5 9	374 10 5	400 10 3
J. C. Trueman	342 11 5	236 19 9	349 13 2	393 4 1
M. L. Ketteringham	393 18 8	247 8 9	355 17 3	379 13 0
Fry Bros.	335 4 7	324 17 6	353 2 4	379 11 9
H. Lee	335 9 0	235 2 10	357 6 6	373 13 1
F. Dupont	319 15 11	238 17 5	344 12 8	369 14 9
Thos. Adams	300 18 5	231 10 0	326 4 8	351 1 11
W. Buxton, Prittlewell, Southend	*257 11 2	275 5 10	302 16 8	326 0 0
E. Iles, Tamworth-ldg., Mitcham, Surrey	294 14 8	*190 15 10	*285 6 1	*301 13 2

* Accepted.

THEYDON GARNON.—For new rectory, Theydon Garnon, Essex. Messrs. Bailey & McConnal, architects, Walsall:—

Lawrence	£4,612	Lynes	£3,825
Jackson & Co.	4 348	T. B. Pitcher	3.734
J. & C. Bowyer	4,061	Barrett & Power	3,710
Morrison & Goodwin	4,033	C. Jackson	3,636
Jos. P. Groome	3,975	W. Hopkins	3,500
Bailey & Holmes	3,917	W. Wade	3,493
Belham & Co.	3,891	Plover & Painter	3,150

WESTON-SUPER-MARE.—For the erection of a conservatory for Mr. H. Butt, Wallclose Villa. Mr. Sydney J. Wilde, architect, Weston-super-Mare:—

G. Sprake	£145 10	W. Dubin	£85 0
Read	112 0	C. Addicott	82 0
Beaven	107 10	A. J. Dorey	74 11
G. Stokes	95 0	Gibbs & Son (accepted)	69 10

WICKLOW.—For the construction of groynes, &c., also dredging channel in the harbour, for the Harbour Commissioners. Mr. Alfred D. Price, C.E., 44, Harcourt-street, Dublin:—

Fisher & Le Faun.	£28,723 13 0	George Lawson, Glasgow*	£22,500 0 0
John Cunningham	25,760 3 8		
John Best	24,501 10 8	Workman & Co.	19,915 0 0
Edward Mainsty	23,940 9 0	R. W. Johnson	17,647 0 0

[Engineer's estimate, £22,576.]

* Accepted.

TO CORRESPONDENTS.

H. L. H. (amounts should have been stated).—G. W. O.—L. L. R. C. (no useful answer can be given without an examination of the building and site).

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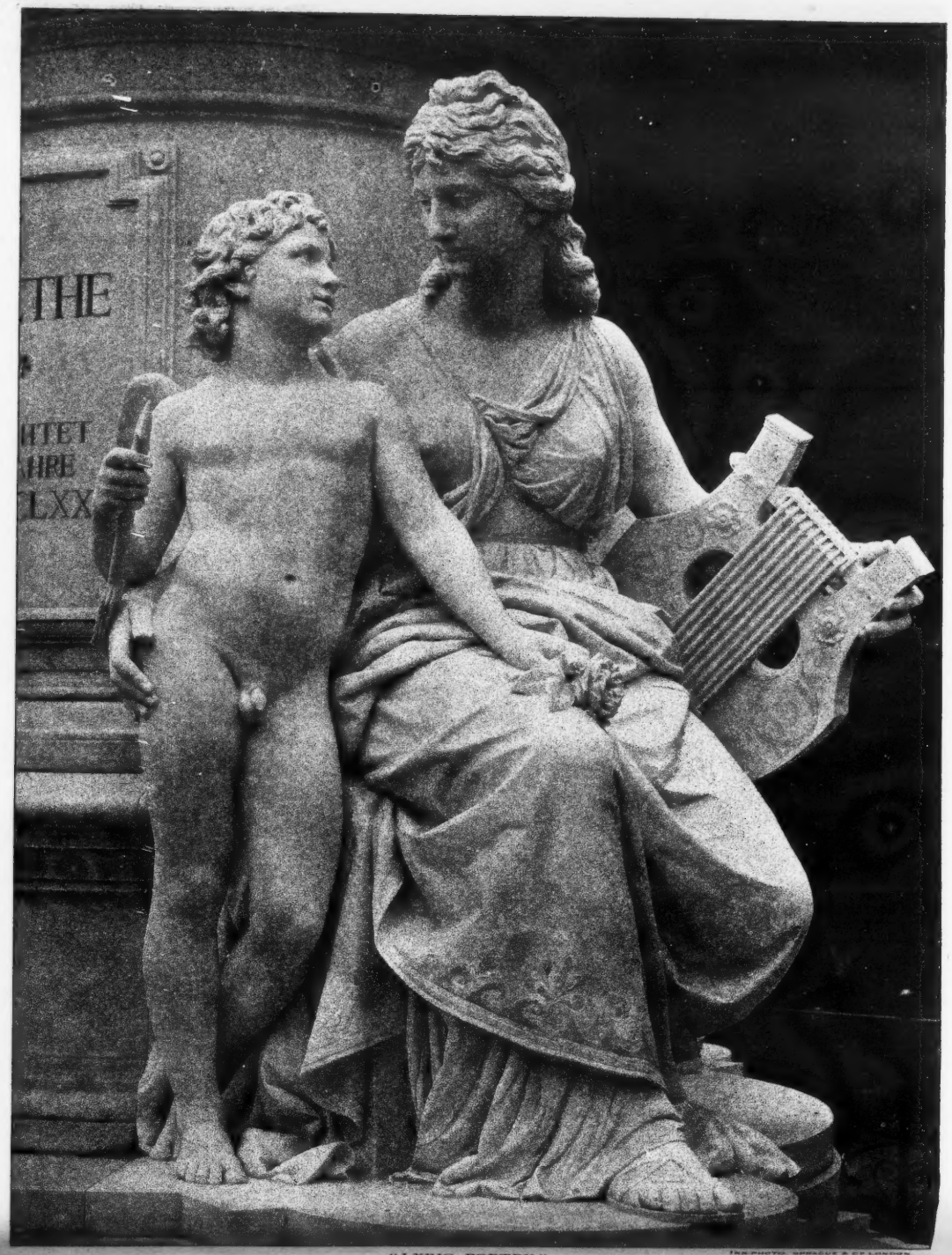

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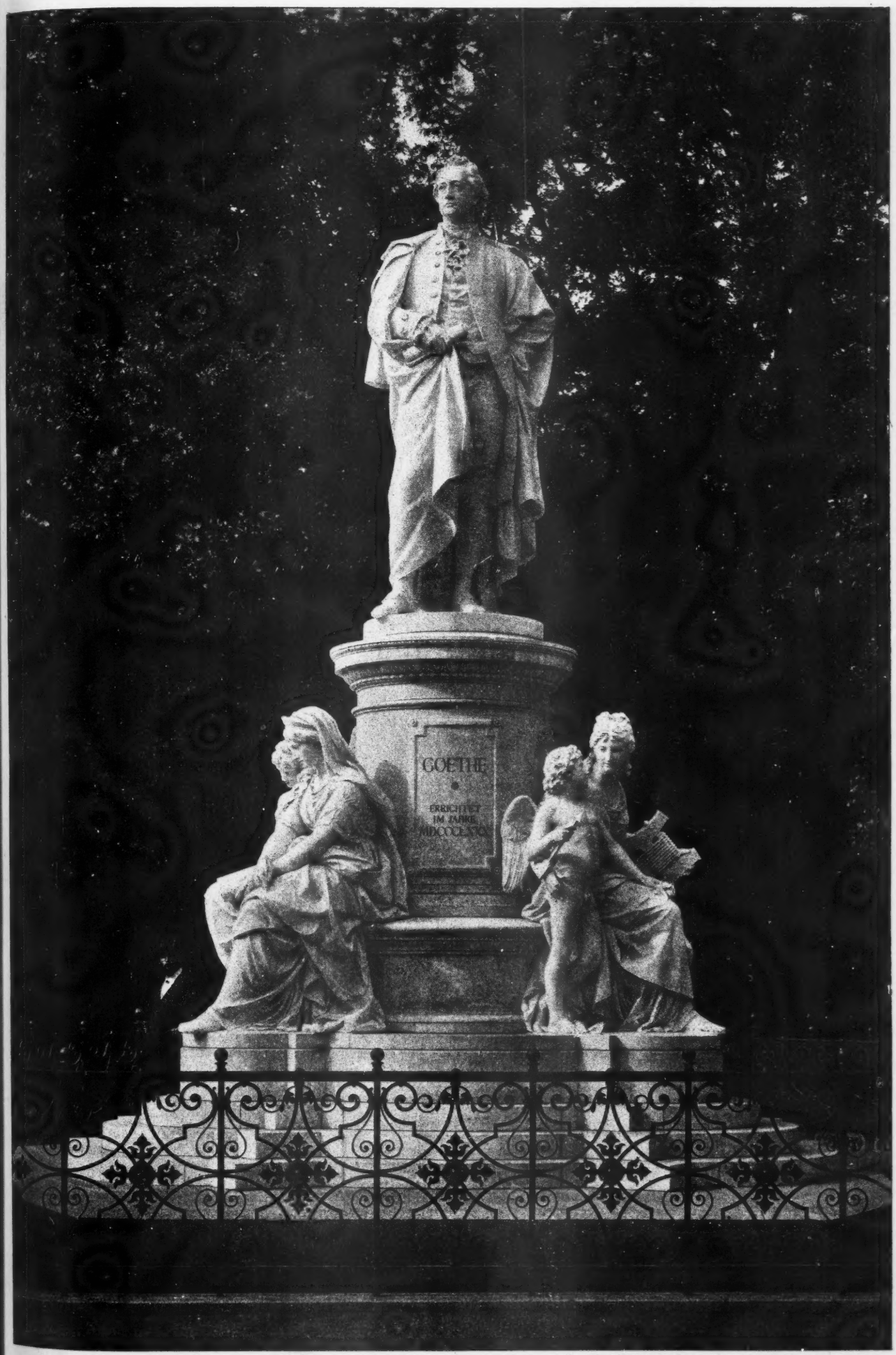

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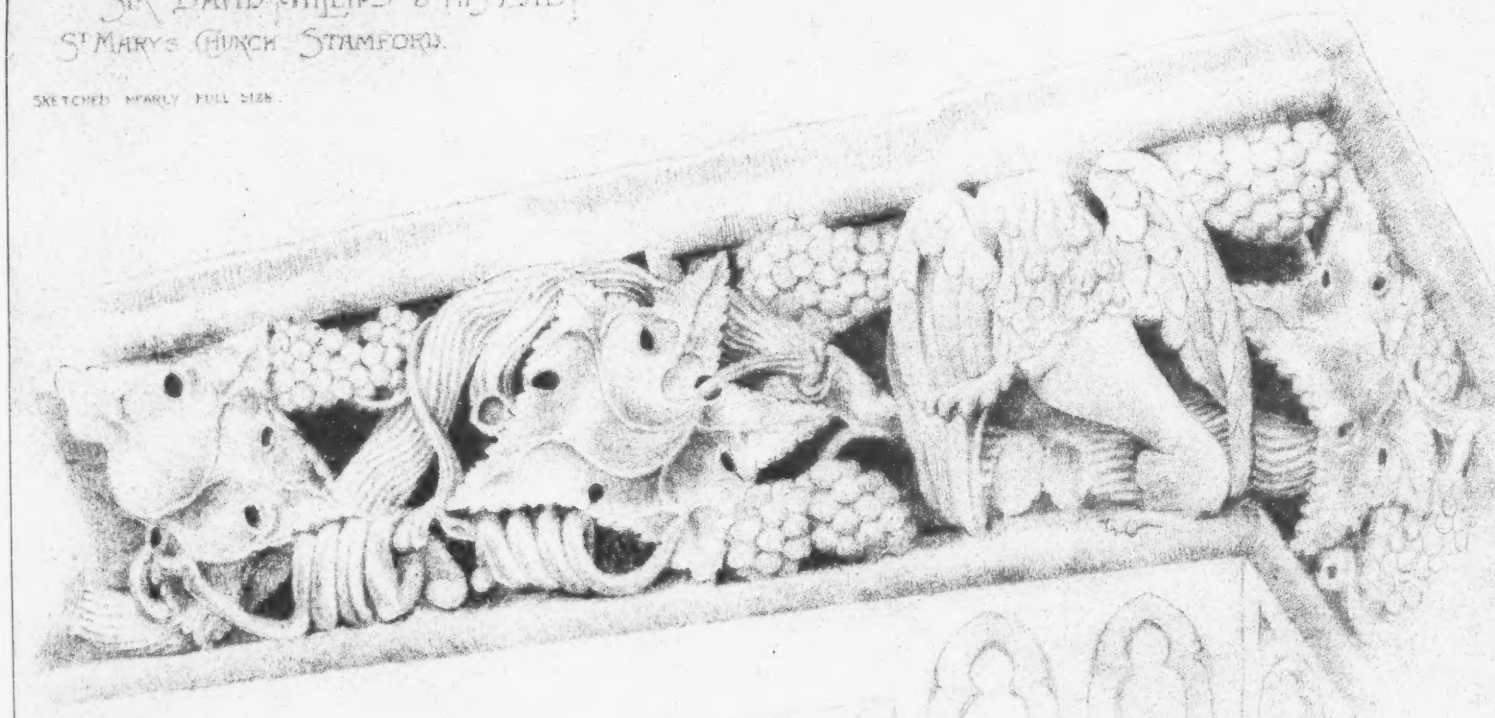
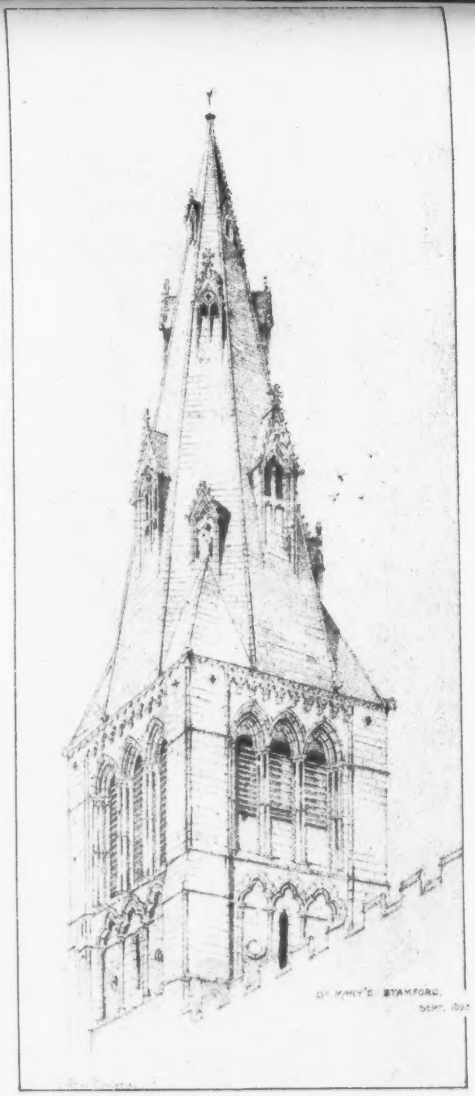
MONUMENT TO GOETHE, BERLIN.—Professor Schafer, Sculptor.

Cornice on the Tomb of
SIR DAVID PHILLIPS & HIS LADY
St MARY'S CHURCH STAMFORD.

SKETCHED NEARLY FULL SIZE.





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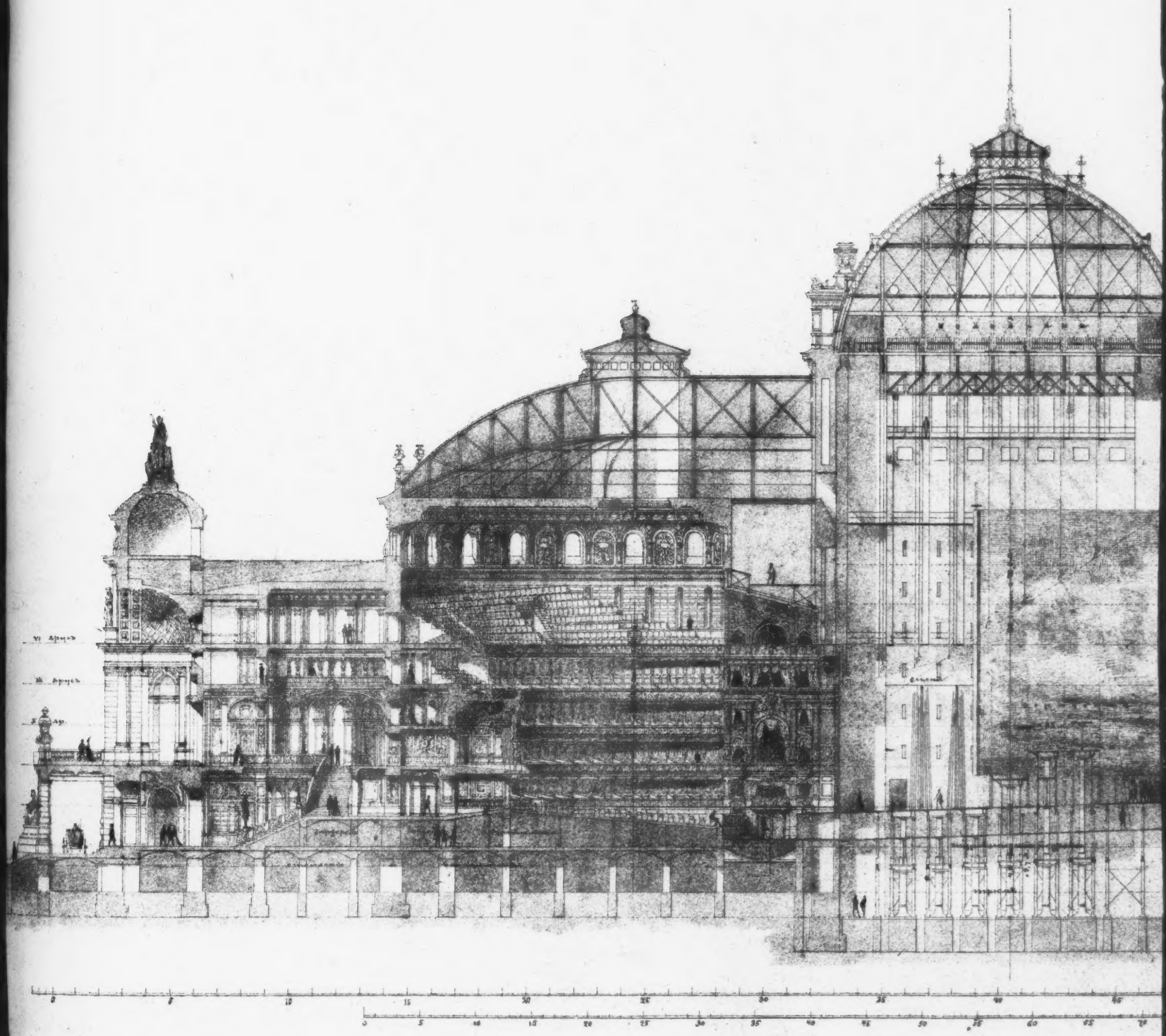
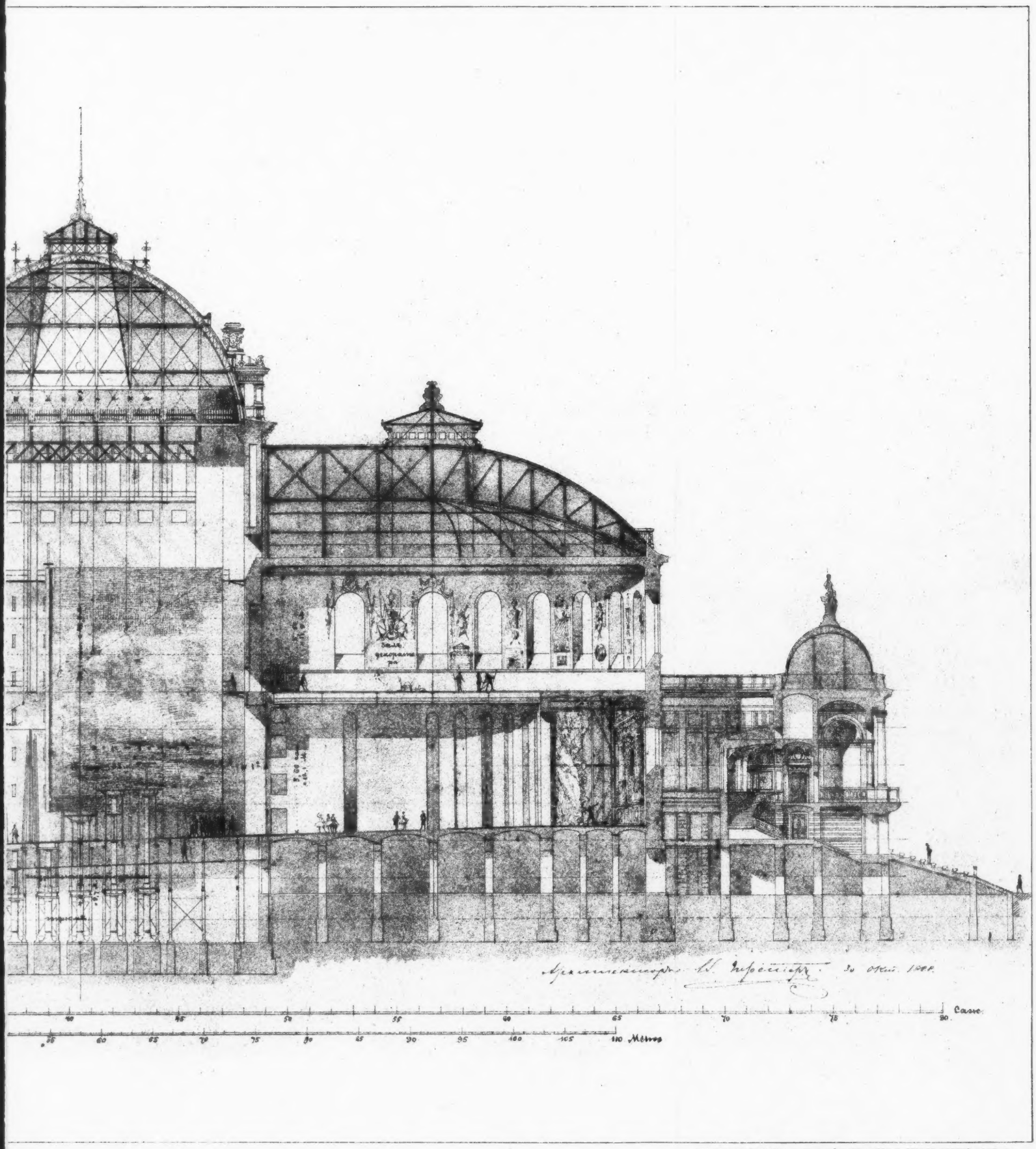


THE NEW OPERA HOUSE, ST. PETERSBURG: LONGITUDINAL SECTION.—



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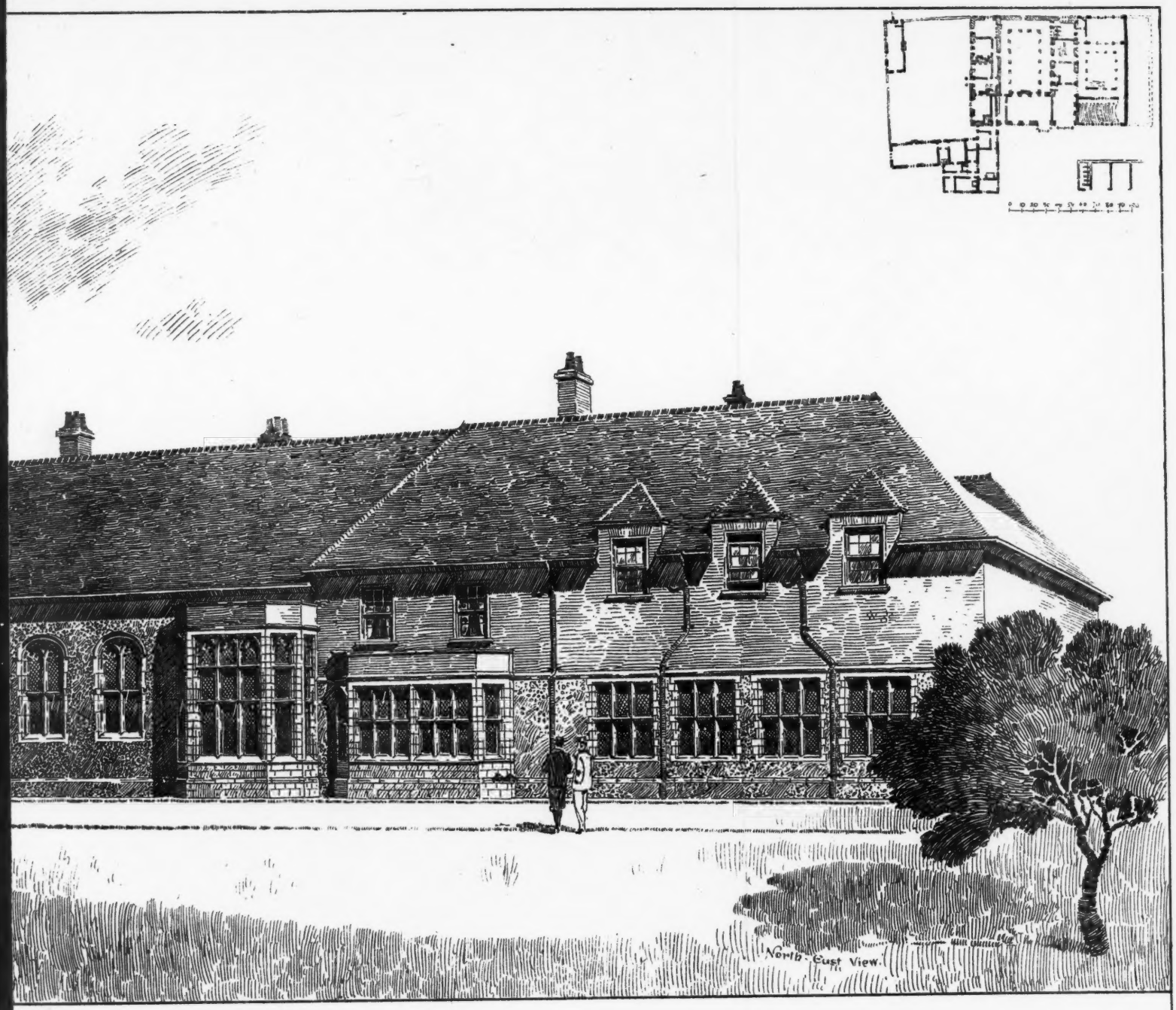
ONGITUDINAL SECTION.—Professor Von Schroeter, Architect

SOUTH-EASTERN AGRICULTURAL COLLEGE, WYE, KENT.—Mr. Pau

STABLES AND ENTRANCE LODGE, BISHAM-ON-THAMES.—Messrs K



LEGE, WYE, KENT.—Mr. Paul B. Chambers, Architect

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HAM-ON-THAMES.—Messrs Kidner & Berry, Architects.